Vol. 1010 Number 1

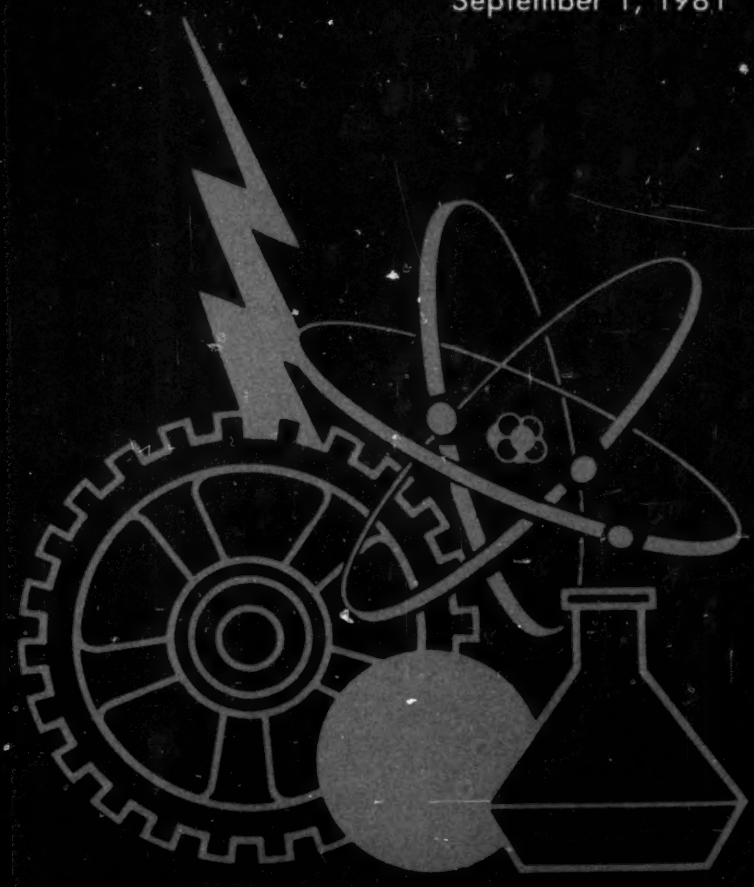
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

September 1, 1981



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

September 1, 1981 Volume 1010 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT, consult Chapter 1800 of the Manual of Patent Examining Procedure and notices 90-95 in the consolidated listing of notices appearing in the Official Gazette of Jan. 6, 1981.

The PCT fees in effect after May 19, 1981 are as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Basic Fee (for the first 30 sheets of an international application)	215.00
Basic Supplemental Fee (for each sheet over 30)	4.00
International Designation Fee (for each State for which a national patent is sought, or group of States for which the same regional patent is sought)	50.00

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

Board of Appeals Decisions Rendered in the Month of July 1981

Affirmed	181
Affirmed in Part	18
Reversed	75
Total	274

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,848,950, Re. S.N. 253,650, Filed May 13, 1981, Cl. 339/90R, ELECTRICAL CONNECTOR, Larry L. McCormick, et al., Owner of Record: *G & H Technology, Inc., Santa Monica, Calif.,* Attorney or Agent: Francis N. Carten, et al., Ex. Gp.: 322

3,851,872, Re. S.N. 242,747, Filed Mar. 11, 1981, Cl. 271/173, SORTING APPARATUS FOR COLLATING SIMPLEX AND DUPLEX COPIES, Dennis Gerbasi, Owner of Record: *Xerox Corp., Stamford, Conn.,* Attorney or Agent: John E. Beck, Ex. Gp.: 313

3,910,119, Re. S.N. 272,317, Filed June 10, 1981, Cl. 73/343.5, RECORDING THERMOMETER, William H. Maxwell, Owner of Record: *Time and Temperature Co., Ventura, Calif.,* Attorney or Agent: Patrick F. Bright, et al., Ex. Gp.: 244

4,104,500, Re. S.N. 260,010, Filed May 4, 1981, Cl. 219/69V, DEVICE FOR ELECTRICAL DISCHARGE MACHINING WITH SIMULTANEOUS RELATIVE ADVANCE AND CYCLE TRANSLATIONAL MOVEMENT OF THE ELECTRODES, George Wyss, Owner of Record: *Ateliers des Charmilles, S.A., Geneva, Switzerland,* Attorney or Agent: Claude A. Patalidis, et al., Ex. Gp.: 213

4,104,501, Re. S.N. 260,305, Filed May 4, 1981, Cl. 219/69M, METHOD OF ELECTRICAL DISCHARGE MACHINE WITH SIMULTANEOUS RELATIVE ADVANCE AND CYCLIC TRANSLATIONAL MOVEMENT OF THE ELECTRODES, George Wyss, Owner of Record: *Ateliers des Charmilles, S.A., Geneva, Switzerland,* Attorney or Agent: Claude A. Patalidis, et al., Ex. Gp.: 213

4,135,400, Re. S.N. 272,319, Filed June 10, 1981, Cl. 73/343.5, ELECTRONIC THERMOGRAPH, William H. Maxwell, et al., Owner of Record: *Time and Temperature Co., Los Angeles, Calif.,* Attorney or Agent: Patrick F. Bright, et al., Ex. Gp.: 244

4,156,984, Re. S.N. 270,903, Filed June 5, 1981, Cl. 43/105, MARINE LIFE TRAP, Warren H. Kinser, Sr., Owner of Record: *Inventor,* Attorney or Agent: Harvey B. Jacobson, Ex. Gp.: 323

4,161,503, Re. S.N. 270,843, Filed June 5, 1981, Cl. 264/136, METHOD OF MAKING MULTITUBULAR SHEATHS, Stanley C. Foulkes, et al., Owner of Record: *Chloride Group Ltd., London, England,* Attorney or Agent: Norman F. Oblon, et al., Ex. Gp.: 147

4,189,686, Re. S.N. 271,141, Filed June 8, 1981, Cl. 331/94.5PE, COMBINATION FREE ELECTRON AND GASEOUS LASER, Charles A. Brau, et al., Owner of Record: *The United States of America as Represented by the United States Energy Research and Development Administration,* Attorney or Agent: James E. Denny, et al., Ex. Gp.: 254

4,206,851, Re. S.N. 257,597, Filed Apr. 27, 1981, Cl. 215/246, TAMPERPROOF CLOSURE, Efrem M. Ostrowsky, Owner of Record: *Ethyl Products Co., Baton Rouge, La.,* Attorney or Agent: Donald L. Johnson, et al., Ex. Gp.: 241

4,248,137, Re. S.N. 257,791, Filed Apr. 27, 1981, Cl. 91/375, FEEDBACK MECHANISM FOR VARIABLE DISPLACEMENT HYDRAULIC DEVICE HAVING AN ELECTROHYDRAULIC CONTROLLER, John T. Caruso, Owner of Record: *Moog, Inc., East Aurora, N.Y.,* Attorney or Agent: Kenneth R. Sommer, et al., Ex. Gp.: 343

4,249,381, Re. S.N. 261,356, Filed May 7, 1981, Cl. 60/562, MASTER CYLINDER, Robert F. Gaiser, Owner of Record: *The Bendix Corp., Southfiled, Mich.,* Attorney or Agent: Leo H. McCormick, Jr., et al., Ex. Gp.: 341

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,171,729, Reexam. No. 90/000,038, Requested: July 29, 1981, Cl. 65/76, METHOD OF MAKING A PARISON, Walter Anderson, Owner of Record: *Virginia Kremm,* Attorney or Agent: Stone, Nierman, Bumeister & Zimmer, Ex. Gp.: 173, Requester: Thatcher Glass Manufacturing Co., Greenwich, Conn.

3,589,495, Reexam. No. 90/000,042, Requested: July 31, 1981, Cl. 198/374, BRICK MAKING MACHINE, Florentin J. Pearne, et al., Owner of Record: *Aircraft Mechanic, Inc.,* Attorney or Agent: McNenny, Farrington, Pearne & Gordon, Ex. Gp.: 310, Requester: EA Industries, Inc., Asheville, N.C.

3,610,994, Reexam. No. 90/000,046, Requested: Aug. 4, 1981, Cl. 307/17, CATHODE-RAY TUBES OF TELEVISION TYPE FOR X-RAYS PROTECTION, Edward Emanuel Sheldon, Owner of Record: *Inventor,* Attorney or Agent: Polachek & Saulsbury, Ex. Gp.: 211, Requester: Richard D. Kelly, Oblon, Fisher, Spivak, McClelland & Maier, Arlington, Va.

3,839,640, Reexam. No. 90/000,041, Requested: July 30, 1981, Cl. 250/353, DIFFERENTIAL PYROELECTRIC SENSOR, John A. Rossin, Owner of Record: *Rossin Corp.,* Attorney or Agent: Evert Allen Autrey, Ex. Gp.: 250, Requester: Eltec Instruments, Inc., Daytona Beach, Fla.

4,013,395, Reexam. No. 90/000,047, Requested: Aug. 6, 1981, Cl. 431/9, AERODYNAMIC FUEL COMBUSTOR, Alex F. Wormser, Owner of Record: *Wingaersheek, Inc.,* Attorney or Agent: William W. Rymer, Ex. Gp.: 345, Requester: Uniweld Products, Inc., Fort Lauderdale, Fla.

4,257,561, Reexam. No. 90/000,045, Requested: Aug. 4, 1981, Cl. 239/581, CHILD-RESISTANT DISPENSING NOZZLE ASSEMBLY, James C. McKinney, Owner of Record: *Ethyl Products Co.,* Attorney or Agent: John F. Sieberth, Ex. Gp.: 313 Requester: Watson, Cole, Grindle & Watson, Washington, D.C.

Vacancy Announcement
Chairman, Trademark Trial and Appeal Board

In accordance with the Senior Executive Service, the position of Chairman of the Trademark Trial and Appeal Board is being advertised. This appointment will be made at a salary of $50,113 per annum, which is the current statutory limit before awards and bonuses are distributed.

Persons interested in being considered for the vacancy, PTO-81-112, are invited to submit their applications to the address given below, on or before Sept. 30, 1981. Applications must be in the Office of Personnel by Sept. 30, 1981. The duties, qualifications, and factors which will be considered in evaluating the candidates are described below.

Duties: Serves as Chairman, Trademark Trial and Appeal Board. Manages the administrative functions of the Board and supervises the technical work of the Board. As a member of the TTAB, exercises original jurisdiction in *inter partes* proceedings and appellate jurisdiction of *ex parte* appeals. Renders written decisions representing the position of the PTO.

Qualifications: Evaluation of qualified candidates will be on the basis of education (self-development), awards, supervisory performance appraisals, managerial/executive qualifications and technical/professional qualifications. Candidates should address all these qualifications in their supplemental statements. Copies of the Qualification Standard are available in Crystal Plaza 2, Room 9C05.

Factors Which Will be Considered in Evaluating Qualified Candidates:

The six managerial/executive factors for SES positions are:

1. Integration of internal and external program policy issues;
2. Organization representation and liaison;
3. Direction and guidance of program, projects or policy development;
4. Resource acquisition and administration;
5. Utilization of human resources;
6. Review of implementation and results.

The technical/professional qualifications are:

1. Law degree and bar membership;
2. Professional legal experience which has provided a comprehensive knowledge of Appellate matters in Trademark law, rules of evidence, the Federal Rules of Civil Procedures, and general principles of ancillary legal subjects;
3. Demonstrated ability to express thoroughly, clearly and accurately the material facts, legal principles and reasons for arriving at a stated conclusion by the application of law to the facts.

Employees of the Department of Commerce may apply by submitting a Merit Program Interest Statement (CD-261), OPM Form 1386, current performance appraisal, updated Personal Qualifications Statement (SF-171) and supplemental statement showing how the qualifications are met. Persons who are not employees of the Department of Commerce should submit a current performance appraisal, Personal Qualifications Statement (SF-171), OPM Form 1386, and supplemental statement. The completed forms should be sent to:

U.S. Patent and Trademark Office
Office of Personnel
Crystal Plaza 2, Room 9C05
2011 Jefferson Davis Hwy.
Arlington, Va. 22202

Questions concerning this notice should be directed to Ms. Marilyn Gannon, Office of Personnel, Room 2-9C05, Telephone (703) 557-3631.

MARGARET M. LAURENCE
July 27, 1981 *Assistant Commissioner for Trademarks.*

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before Sept. 25, 1981:

Organ, Mark E., 2700 Chadwick, Plano, Tex. 75075
O'Hare, Thomas P., 1121 Arlington Blvd., Apt. 633T, Arlington, Va. 22209
Redman, John W., 9 High Ridge Rd., Ocean, N.J. 07712
Sherr, Kittie M., 17 Hamilton Ave., Weehawken, N.J. 07087

LUTRELLE F. PARKER
July 29, 1981 *Chairman, Committee on Enrollment.*

Automated Search Experiments

The United States Patent and Trademark Office (PTO) intends to carry out research and evaluation projects dealing with automated full-text searching of U.S. Patents.

To further this objective, the PTO has entered into an agreement with Mead Data Central to provide the PTO access to and support for the use of the LEXIS full-text system. Using that system, the PTO will test and evaluate the effectiveness of searching the full text of over 50,000 U.S. patents. As part of this experiment, the PTO will furnish to Mead Data Central a special compilation of tapes from an extensive library of computer tapes containing the full text of U.S. patents from 1970 to the present.

The PTO would welcome multiple experiments using the same or similar techniques and/or technology as Mead Data Central, and thus, the PTO is willing to enter into the same agreement, or a similar agreement on mutually agreeable terms, with any other responsible party, within 18 months from the date of this notice.

Additional information regarding this matter may be *obtained from:*

Donald P. Stein, Director
Office of Search Systems
U.S. Patent & Trademark Office
Washington, D.C. 20231
TEL: 703-557-3763

GERALD J. MOSSINGHOFF
Aug. 3, 1981 *Commissioner of Patents and Trademarks.*

Sale of Copies of Reexamination Requests

Copies of reexamination requests, all cited references, and the file wrapper and contents of the patent file for which reexamination is requested are available at a charge of $0.30 per page. Orders for such copies must indicate the control number assigned the reexamination request. Orders should be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: Customer Services Division.

GERALD J. MOSSINGHOFF
July 31, 1981 *Commissioner of Patents and Trademarks.*

Mailing of Patent and Trademark Registration Copies

The Patent and Trademark Office has recently begun mailing domestic orders for copies of U.S. patents and trademark registrations as fourth class material, on an experimental basis. The United States Postal Service has indicated that there should be no significant delay in the delivery of fourth class materials in comparison to the first class mailings which have been used in the past. This experiment will continue for six months, at which time a final determination will be made as to the most appropriate class of mail service to be used when filling such orders.

GERALD J. MOSSINGHOFF
July 31, 1981 *Commissioner of Patents and Trademarks.*

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Post Office as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

New England Toyota Distributor, Inc., Woburn, MA., Reg. No. 1,083,915, Canc. No. 12,927.
J. Freezer & Son, Inc., New York, N.Y., Reg. No. 839,188, Canc. No. 12,930.

ERMA S. BROWN,
Deputy Clerk, Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

March—July 1981 Classification Orders

The reclassifications covered by the classification changes below became effective Mar. 1, 1981 through July 31, 1981. In the future, notice of these changes will be published monthly. Addenda information will continue to be published quarterly.

Classification Order 774, effective Mar. 11, 1981

	Class	Subclasses
Abolished	65	21
Established	65	21.1–21.5

Classification Order 775, effective Mar. 11, 1981

	Class	Subclass
Abolished	264	209
Established	264	209.1–209.8

Classification Order 776, effective Mar. 16, 1981

	Class	Subclasses
Abolished	428	538; 539
Established	428	688–703

Classification Order 777, effective Mar. 24, 1981

	Class	Subclasses
Abolished	307	203–218; 229; 230; 232; 233; 237; 238; 251; 293–295
	328	92–94
Established	307	238.1–238.8; 440–482; 490–503; 510–530; 540–568; 570–585; 590–608

Classification Order 778, effective Apr. 3, 1981

	Class	Subclasses
Abolished	72	253; Digests 1–31
Established	72	253.1; 273.5; CROSS-REFERENCE ART COLLECTIONS 706–711

Classification Order 779, effective Apr. 6, 1981

	Class	Subclasses
Abolished	156	331
Established	156	307.4; 330.9; 331.1–331.9
Title Change	156	307.1

Classification Order 780, effective Apr. 6, 1981

	Class	Subclasses
Abolished	260	449–452
Established	260	398.6
	518 (NEW)*	700–728
	560	241.1
	562	512.2; 512.4
	568	398.8; 469.9; 910.5; 950–959
Title Change	568	558; 563

*Newly established Class 518 Definition separately available.

Classification Order 781, effective Apr. 6, 1981

	Class	Subclasses
Abolished	224	45–58; 137
Established	294	137–172

Classification Order 782, effective Apr. 7, 1981

	Class	Subclasses
Abolished	D12	62–81
Established	D12	300–345
Title Change	D3	35
	D16	31

Classification Order 783, effective Apr. 14, 1981

	Class	Subclasses
Abolished	131	1–26; 120–172; 261–269
Established	131	270–375;

CROSS-REFERENCE
ART COLLECTIONS
900–910

Classification Order 784, effective Apr. 21, 1981

	Class	Subclasses
Abolished	252	8.1
Established	252	601–611

Classification Order785, effective Apr. 24, 1981

	Class	Subclasses
Abolished	252	299
Established	252	299.01–299.6; 299.61–299.68; 299.7

Classification Order 786, effective Apr. 24, 1981

	Class	Subclasses
Abolished	564	436
Indent Changes	564	437–443
Title Changes	544	190; 200; 352; 395; 410
	546	181; 319; 348
	564	3; 225; 253; 277; 306; 317; 335

Classification Order 787, effective Apr. 27, 1981

	Class	Subclasses
Established	525	CROSS-REFERENCE ART COLLECTION 942

Classification Order 788, effective May 13, 1981

	Class	Subclasses
Abolished	102	1–105; 203; 278–280
Established	102	202.1–202.9; 202.11–202.14 275.1–275.9; 275.11; 275.12; 277.1; 277.2; 282–293; 301; 532; CROSS-REFERENCE ART COLLECTIONS 700–705
Title Change	102	

Classification Order 789, effective May 22, 1981

	Class	Subclasses
Abolished	100	Digests 1–8
Established	100	CROSS-REFERENCE ART COLLECTIONS 901–918

Classification Order 790, effective May 26, 1981

	Class	Subclasses
Abolished	24	73–88
Established	24	287–380

Classification Order 791, effective May 27, 1981

	Class	Subclasses
Abolished	73	133–145
Established	73	862; 862.01–862.09; 862.11–862.19; 862.21–862.29; 862.31–862.39; 862.41–862.49; 862.51–862.59; 862.61–862.69

Classification Order 792, effective May 28, 1981

	Class	Subclasses
Abolished	525	359
Established	525	359.1–359.6

Classification Order 793, effective May 28, 1981

	Class	Subclasses
Abolished	264	271; 272
Established	264	271.1; 272.11–272.21; 279.1

Classification Order 794, effective June 2, 1981

	Class	Subclasses
Abolished	178	22
	375	2
Established	178	22.01–22.19
	375	2.1; 2.2

Classification Order 795, effective June 2, 1981

	Class	Subclasses
Abolished	165	104–107
Established	165	104.11–104.19; 104.21–104.29; 104.31–104.34

Classification Order 796, effective June 2, 1981

	Class	Subclasses
Abolished	73	421–425.6
Established	73	863; 863.01–863.03; 863.11; 863.12; 863.21–863.25; 863.31–863.33; 863.41–863.45; 863.51–863.58; 863.61; 863.71–863.73; 863.81–863.86; 863.91; 863.92; 864; 864.01–864.03; 864.21–864.25; 864.31–864.35; 864.41–864.45; 864.51–864.59; 864.61–864.67; 864.71–864.74; 864.81; 864.91

Classification Order 797, effective July 7, 1981

	Class	Subclasses
Abolished	62	2
Established	62	235.1

Classification Order 798, effective July 7, 1981

	Class	Subclasses
Abolished	D14	40–51
Established	D14	100–117

Classification Order 799, effective July 7, 1981

	Class	Subclasses
Abolished	60	641
Established	60	641.1–641.9; 641.11–641.15

Classification Order 800, effective July 15, 1981

	Class	Subclasses
Abolished	252	300
Established	252	582–589

Classification Order 801, effective July 27, 1981

	Class	Subclasses
Abolished	65	3; 4; 11; 18; 30; Digests 2; 14; 16
Established	65	3.1–3.15; 3.2; 3.3; 3.31; 3.4–3.44; 4.1; 4.2; 4.21; 4.3; 4.4; 10.1; 10.2; 11.1; 18.1–18.4; 30.1–30.14

RENE D. TEGTMEYER
July 30, 1981 *Assistant Commissioner for Patents & Trademarks.*

Set XVIII of Addenda to the Classification Definitions

The definitions of the classes listed below were modified by addenda as part of Classification Orders issued between Oct. and Dec. 31, 1980. All of these addenda have been consolidated as Set XVIII of "Addenda to the Classification Definitions".

Class	Class	Class	Class
4	86	175	266
7	89	178	269
8	93	179	270
10	99	180	271
11	100	181	272
15	101	185	273
16	102	192	274
23	104	196	281
26	106	198	283
29	112	201	294
30	113	203	307
33	114	204	310
34	116	206	312
35	118	208	313
40	119	209	315
43	122	210	318
44	124	220	324
46	125	221	328
51	126	222	329
52	127	223	331
53	128	226	332
55	131	227	333
57	134	228	334
60	137	233	335
62	138	235	336
65	140	241	337
68	144	242	338
70	145	244	340
71	156	248	343
72	157	250	346
73	159	251	350
74	162	252	351
76	164	254	352
81	165	260	353
83	166	261	354
84	173	264	355
356	368	423	455
358	370	424	493
360	375	425	521
361	400	427	528
362	404	428	562
364	405	430	564
365	408	434	570
366	418	435	585
367	422		

Newly established classes issued between Oct. and Dec. 1980:

434
493
564
570

RENE D. TEGTMEYER
July 30, 1981 *Assistant Commissioner for Patents & Trademarks.*

Set XIX of Addenda to the Classification Definitions

The definitions of the classes listed below were modified by addenda as part of Classification Orders issued between Jan. and Mar. 31, 1981. All of these addenda have been consolidated as Set XIX of "Addenda to the Classification Definitions".

Class	Class	Class	Class
13	165	282	346
15	171	285	350
16	172	292	351
24	174	293	352
29	175	294	353
30	179	295	355
37	181	299	356
52	184	301	357
55	185	303	358
59	188	307	360
62	192	310	361
65	198	312	362
73	204	314	363
74	206	315	364
81	213	318	365
84	219	320	367
85	221	322	368
89	222	323	369
98	226	324	370
101	227	328	371
106	236	329	375
108	237	330	402
109	238	331	403
116	242	332	405
118	249	333	411
122	250	334	425
128	251	335	428
134	264	336	429
136	269	337	430
151	274	338	431
160	279	340	455
164	280	343	

Newly established classes issued between Jan. and Mar. 1981:

369
411

RENE D. TEGTMEYER
July 30, 1981 *Assistant Commissioner for Patents & Trademarks.*

PATENT NOTICES

Certificates of Correction for the Week of Sept. 1, 1981

Re. 30,472	4,243,766	4,260,643	4,268,060
Re. 30,651	4,244,601	4,261,152	4,268,380
3,845,187	4,245,121	4,261,421	4,268,496
4,001,256	4,246,340	4,261,922	4,269,169
4,052,495	4,247,528	4,261,950	4,269,316
4,125,713	4,247,592	4,262,001	4,269,401
4,135,009	4,247,625	4,262,078	4,269,630
4,138,576	4,247,687	4,262,311	4,269,720
4,155,613	4,248,689	4,262,359	4,269,844
4,166,487	4,251,436	4,262,426	4,270,313
4,166,832	4,251,755	4,262,544	4,270,358
4,173,604	4,251,863	4,262,580	4,270,440
4,182,824	4,252,013	4,262,629	4,270,470
4,183,632	4,252,617	4,262,632	4,271,440
4,190,656	4,252,714	4,262,719	4,271,525
4,195,183	4,253,256	4,262,770	4,271,944
4,201,682	4,253,430	4,262,965	4,272,052
4,209,636	4,254,068	4,263,219	4,272,176
4,209,936	4,254,074	4,263,809	4,272,733
4,212,654	4,254,223	4,263,840	4,272,833
4,217,235	4,255,177	4,263,910	4,273,175
4,217,914	4,255,178	4,263,922	4,273,272
4,218,242	4,255,179	4,264,174	4,273,575
4,223,170	4,255,274	4,264,208	4,273,588
4,223,582	4,255,329	4,264,464	4,273,725
4,228,305	4,255,431	4,264,597	4,273,892
4,230,134	4,256,505	4,264,611	4,273,895
4,232,560	4,256,650	4,264,655	4,274,528
4,232,760	4,256,893	4,264,829	4,274,555
4,234,713	4,256,972	4,265,320	4,274,665
4,236,268	4,257,272	4,266,292	4,274,942
4,236,515	4,257,423	4,266,687	4,275,206
4,237,008	4,257,717	4,266,810	4,275,355
4,237,365	4,257,958	4,266,932	4,275,787
4,239,678	4,258,031	4,267,140	4,275,896
4,242,287	4,258,841	4,267,852	4,277,512
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Science & Education Administration
Hyattsville, Md. 20782

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Assistant General Counsel for Patents (GC-42)
1000 Independence Ave., NW.
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Arlington, Va. 22217

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Washington, D.C. 20546

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New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
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PATENT EXAMINING CORPS

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CONDITION OF PATENT APPLICATIONS AS OF July 25, 1981

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	4-29-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-11-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	6-25-80
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	7-11-80
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-03-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	1-07-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	1-03-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—VACANT ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-31-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	6-08-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	3-28-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	11-01-79
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-09-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	2-06-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	7-30-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	10-22-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during July 1981, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,139,622 to 3,142,840, inclusive

Plant Patents ..... Numbers 2,416 to 2,430, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED SEPTEMBER 1, 1981

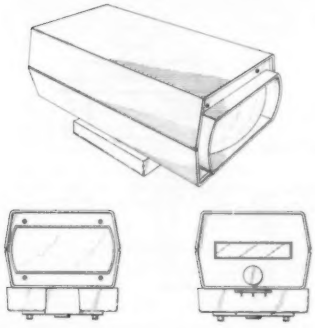
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T101,001
ELECTRONIC DISTANCE MEASURING INSTRUMENT

John I. Shipp, 1422 S. Country Club La., and Charlie C. Rogers, P.O. Box 1107, both of Tullahoma, Tenn. 37388

Filed May 28, 1980, Ser. No. 154,044
Int. Cl. D10/04
U.S. Cl. D10—70
2 Sheets Drawing. 2 Pages Specification



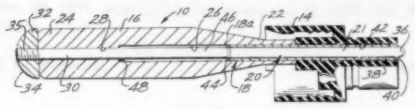
The design relates to an electronic distance measuring instrument substantially as shown.

T101,002
TOOL FOR MANUALLY INSERTING ELECTRICAL CONTACTS

Rayburn P. Ellington, III, 4714 N. Laurel Dr., Peoria, Ill. 61614

Filed Mar. 4, 1980, Ser. No. 127,151
Int. Cl.[3] H01R 43/00
U.S. Cl. 29—747
2 Sheets Drawing. 6 Pages Specification

A hand tool for inserting and removing electrical contacts from shaped axial bores formed in coupling-type elastic connector housings has coacting members that allow removal,



ready reception and accurate placement of the contacts within the axial housing bores.

T101,003
PREVENTATIVE THERAPY AGAINST HUMAN CANCER

Shane A. Watson, 7 Bragge St., Frankston, Victoria, Australia 3199

Filed Apr. 4, 1979, Ser. No. 26,811
Int. Cl.[2] A61K 31/195
U.S. Cl. 424—319
No Drawing. 11 Pages Specification

A method for prophylaxis against human cancer which comprises the administration of chelating or complexing agents capable of removing from the human body the various isotopic forms of lead and their radioactive precursors.

T101,004
BLOCKED PYRAZOLONE MAGENTA DYE-FORMING COUPLERS

Thomas E. Gompf; Howell A. Hammond, and Jared B. Mooberry, all of Kodak Park Works, Rochester, N.Y. 14650

Division of Ser. No. 124,872, Feb. 26, 1980. This application Dec. 29, 1980, Ser. No. 220,579
Int. Cl.[3] C07D 231/10
U.S. Cl. 548—373
No Drawing. 43 Pages Specification

Novel 5-pyrazolone magenta dye-forming couplers are blocked with a coupler moiety which yields an alkali-soluble or colorless reaction product. The coupler moiety is joined via its coupling position to the enol oxygen of the 5-pyrazolone and is displaced therefrom during processing as a result of reaction by means of oxidized color developing agent to thereby activate the 5-pyrazolone coupler. These couplers have good reactivity and good resistance to aerial contaminants, such as formaldehyde, and can be incorporated in photographic emulsions and elements.

REISSUES

SEPTEMBER 1, 1981

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,725

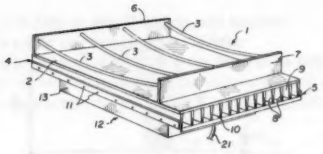
FIREPLACE GRATE

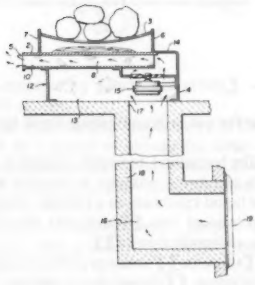
John G. Meeker, Deansbridge Rd., Somers, N.Y. 10589

Original No. 4,076,012, dated Feb. 28, 1978, Ser. No. 627,184, Oct. 30, 1975. Application for reissue Feb. 26, 1980, Ser. No. 124,665

Int. Cl.[3] **F23H** *13/00;* **F28F** *3/14*

U.S. Cl. 126—164 **33 Claims**





28. A system for increasing the heating efficiency of a fireplace fire which comprises:

a. air passageway means having air inlet and outlet means and being bounded by spaced first and second plate means, said first plate means defining a heat transfer structure and being formed of extruded aluminum having a plurality of closely spaced fin means integrally formed therewith and extending toward said second plate means to divide said air passageway means into a plurality of separate air subpassageways, said heat transfer structure being positioned intermediate said fire and said second plate; and

b. means for forcing an air circulation between said air passageway means inlet and outlet means at sufficient rate to preclude overheating of the area beyond said heat transfer structure.

Re. 30,726

POLYMER FILM HAVING LINEAR TEAR PROPERTIES

Norman J. Otten, Prospect Heights, and Eldrige H. Presnell, Round Lake, both of Ill., assignors to Tower Products, Inc., Mundelein, Ill.

Original No. 4,098,406, dated Jul. 4, 1978, Ser. No. 713,703, Aug. 12, 1976. Continuation-in-part of Ser. No. 486,082, Jul. 5, 1974, abandoned. Application for reissue Oct. 9, 1979, Ser. No. 82,992

Int. Cl.[3] **B65D** *33/00;* **B29C** *17/06;* **B32B** *27/08*

U.S. Cl. 206—601 **14 Claims**

1. A method of imparting linear tear properties in the direction of extrusion to a polymer film comprising the steps of preparing a blend of resins consisting essentially of from about 12% to about 95% ionomer resin and from about 5% to about 88% low density polyethylene resin, and extruding said blend of resins *at a stretch ratio of approximately 1.5 to 1* into a film [,] whereby said film exhibits linear tear properties in a direction parallel to the direction of extrusion *and an Elmendorf tear strength of from 30 to 125 g.*

Re. 30,727

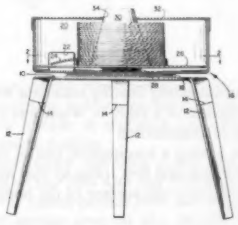
CABLE DISPENSER

Robert S. Y. Chong, 98-1137 Kaonnoi St., Aiea, Hi. 96701

Original No. 4,015,795, dated Apr. 5, 1977, Ser. No. 625,891, Oct. 28, 1975. Application for reissue Apr. 5, 1979, Ser. No. 27,461

Int. Cl.[3] **B65H** *49/00, 75/30*

U.S. Cl. 242—85 **10 Claims**



10. A cable dispenser comprising a relatively stationary base, a cable dispensing control member having a bottom and an upstanding substantially cylindrical side wall, means mounting said member on said base for free rotation about the axis of said side wall, a turntable for supporting a coil of cable disposed within said member, means mounting said turntable for free rotation about said axis independently of rotation of said member, and means providing a dispensing opening at said wall through which the cable may be withdrawn from the dispenser, whereby when cable is pulled out through said opening said member is automatically oriented to align said opening with the cable payout direction while said turntable is free to relatively rotate as the cable is pulled out of the dispenser.

Re. 30,728

HIGH SPEED FOCUSING TELEPHOTO LENS

Hideo Yokota, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Original No. 4,068,929, dated Jan. 17, 1978, Ser. No. 678,364, Apr. 19, 1976. Application for reissue Feb. 27, 1979, Ser. No. 15,644

Claims priority, application Japan, Apr. 23, 1975, 50-49384

Int. Cl.[3] **G02B** *9/60, 9/62*

U.S. Cl. 350—464 **29 Claims**

19. A telephoto lens comprising: a front lens group which has a positive power and remains stationary during focusing; and a rear lens group having a negative power and including at least one movable sub-group and a rearmost sub-group having a negative power, whereby the focusing of said telephoto lens is effected by axially moving said movable sub-group and said rearmost sub-group remains stationary during focusing.

Re. 30,729

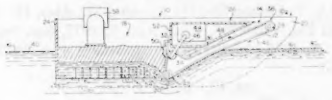
FLOATAGE COLLE. TING APPARATUS AND METHOD

James H. Farrell; Ralph A. Bianchi, both of Lexington, and Edward E. Johanson, Andover, all of Mass., assignors to JBF Scientific Corporation, Wilmington, Mass.

Original No. 3,804,251, dated Apr. 16, 1974, Ser. No. 231,977, Mar. 6, 1972. Continuation of Ser. No. 767,833, Feb. 11, 1977, abandoned, and a continuation-in-part of Ser. No. 151,838, Jun. 10, 1971, abandoned. Application for reissue May 30, 1978, Ser. No. 910,513

Int. Cl.[3] B01D *21/00*

U.S. Cl. 210—801 27 Claims



1. Apparatus for skimming floating materials, *whether solid or liquid,* from the surface of a body of water and collecting the same comprising, in combination

A. a first roller having a longitudinal axis of rotation,

B. means positioning said first roller so that its axis of rotation is located above the surface of the body of water,

C. a second roller,

D. means positioning said second roller so that its longitudinal axis of rotation is parallel to the first roller and horizontally spaced therefrom, at least a portion of said second roller surface being below the surface of the body of water and the lower horizontal tangent of said second roller being below the lower horizontal tangent of said first roller,

E. endless-*belt* material transport means carried by said rollers,

F. means for driving at least one of said rollers in a direction so that the lower flight of said material transport means moves downwardly from said first roller to said second roller,

G. means forming a materials collecting and retaining well, said well

1. having a bottom opening and an enclosed periphery formed by sidewalls extending from above said surface to below it, said sidewalls which extend transversely to the horizontal spacing between said rollers extending downwardly substantially only to the level of said lower horizontal tangent of said second roller,

2. having said bottom opening disposed aft of said second roller and extending along the length of said well for the passage therethrough of said material and of water, and

H. perforated baffle means horizontally disposed at least partially spanning said well bottom opening substantially at said level of said lower horizontal tangent of said second roller, for passing said material into said well and for blocking the flow of turbulent currents into said well through said bottom opening, whereby

said transport means removes floating material from the surface of the water downwardly toward said second roller, and discharges said material below the water surface for the entry thereof into said well through said opening and at least in part through said baffle means.

Re. 30,730

APPARATUS FOR USE IN INVESTIGATING SPECIMENS

Ian D. Duff, Briarcliff Manor, N.Y., assignor to National Research Development Corporation, London, England

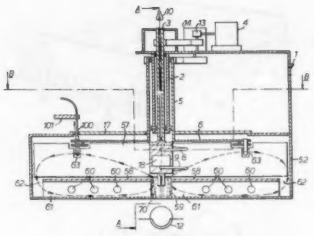
Reissued No. Re. 29,880, dated Jan. 16, 1979, Ser. No. 881,842, Feb. 27, 1978.

Original No. 4,054,416, dated Oct. 18, 1977, Ser. No. 714,677, Aug. 11, 1976. Application for reissue Oct. 12, 1979, Ser. No. 84,381

Claims priority, application United Kingdom, Jun. 11, 1975, 25-118/75; Aug. 20, 1975, 34676/75

Int. Cl.[3] F27D *11/00;* B01L *7/02, 9/06;* G01N *1/10*

U.S. Cl. 422—64 8 Claims



1. Apparatus for use in investigating liquid specimens comprising

a substantially horizontal turntable having a central rotational axis and being adapted to support a plurality of vessels for liquid specimens in a circular array centered on the said rotational axis [[such that the vessels extend below the underside thereof]];

means for [[stepwise]] rotation of the turntable for specimen investigation [[during dwell periods; an enclosure disposed beneath the turntable to define a space bounded laterally and at the bottom of said enclosure and upwardly by the turntable and into which the vessels extend when positioned in the turntable; temperature changing means for changing the temperature of air in said space; air circulating means disposed in said space and arranged to circulate air between the temperature changing means and the vessels wholly within said space; a control device for the air temperature changing means arranged to maintain the temperature of the vessels substantially at a predetermined value]]; and

a liquid dispenser mounted adjacent the turntable for dispensing liquid specimens into different vessels in the turntable [[during respective dwell periods thereof]], the dispenser comprising

a tubular body [[of a high thermal conductivity]] having an inlet through which liquid may enter said tubular body[[,]] and an outlet which comprises a dispensing tip of high thermal conductivity through which liquid may leave the tubular body,

said tubular body also including a cavity adjacent said outlet,

the dispenser being provided with means for charging the tubular body with liquid by way of said inlet and for dispensing predetermined quantities of such liquid,

said tubular body including [[an electric heating coil, wound around]] **heating means** substantially **along** its length and [[a thermistor positioned]] **temperature control means** in said cavity to control said heating [[coil]] **means** to maintain the temperature of the liquid being dispensed substantially at a predetermined value.

Re. 30,731

ENKEPHALIN ANALOGUES

Derek Hudson, 23A Elm Rd., Wembley, Middlesex; Robert Sharpe, 99 King House, Ducane Rd., London W12 OHS, and Michael Szelke, 10 North Dr., Ruislip, Middlesex, all of England

Original No. 4,198,398, dated Apr. 15, 1980, Ser. No. 923,478, Jul. 10, 1978. Application for reissue Aug. 14, 1980, Ser. No. 178,345

Claims priority, application United Kingdom, Jul. 12, 1977, 29207/77; Dec. 8, 1977, 51159/77

Int. Cl.[3] A61K *37/00*; C07C *103/52*

U.S. Cl. 424—177 24 Claims

1. Compounds having the general formula

R—Tyr—X—Gly—B—Y—Z

where

(a) —X is a Gly or any D-amino acid residue

—B is a Phe or N-methyl Phe residue

—Y is Leu, Met (as such or in the form of its sulphoxide), Pro, or Hypro, or formal derivatives thereof in which the [carbonyl oxygen of the] terminal [carboxyl]

group is replaced by [hydrogen atoms] $-CH_2-Z$

—Z is NHR or OR

(b) The peptide link between one or more of the residues is represented by a group or groups the same or different selected from dimethylene *(except where X=Gly and the Gly-Gly link is involved)*, methylene-imino and ketomethylene groups.

(c) R is hydrogen or methyl, ethyl, propyl, cyclopropyl, butyl, allyl or other protective aliphatic group.

Re. 30,732

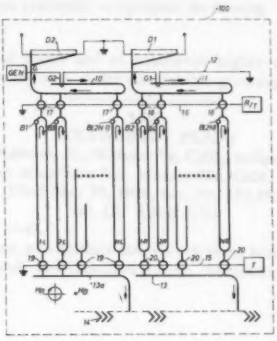
CONSECUTIVE BIT ACCESS OF MAGNETIC BUBBLE DOMAIN MEMORY DEVICES

Isoris S. Gergis, 5892 Lynnbrook Plz., Yorba Linda, Calif. 92686

Original No. 4,075,611, dated Feb. 21, 1978, Ser. No. 633,306, Nov. 19, 1975. Application for reissue Jul. 25, 1979, Ser. No. 60,690

Int. Cl.[3] G11C *19/08*

U.S. Cl. 365—15 22 Claims



14. In a magnetic bubble memory device having a magnetic film for supporting magnetic bubbles, including generator means for creating magnetic bubbles in said film, and detector means for sensing said magnetic bubbles,

the improvement which comprises a first and second storage area located on said film with said first storage area a different number of bubble periods from said detector means than said second storage area, so that bubbles from said first storage area arrive at said detector means at a different cycle of rotation than bubbles from said second storage area, enabling consecutive bit reading of said magnetic bubbles.

PLANT PATENTS

GRANTED SEPTEMBER 1, 1981

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,762

MINIATURE ROSE PLANT

Jack E. Christensen, Ontario, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Jun. 11, 1980, Ser. No. 158,354
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid miniature class, substantially as herein shown and described, and being especially characterized in the profusion of its blooms throughout the growing season, and the uniformity of the coral and pink coloration of the same, said plant being vigorous and hardy and of somewhat higher than average resistance to mildew, under comparable growing conditions.

4,763

STRAWBERRY PLANT

Harold A. Johnson, Jr., Watsonville, Calif., assignor to Driscoll Strawberry Associates Inc., Watsonville, Calif.

Filed May 27, 1980, Ser. No. 153,392
Int. Cl.[3] A01H *5/03*
U.S. Cl. Plt.—49 **1 Claim**

1. The new and distinct strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.

PATENTS

GRANTED SEP. 1, 1981

ERRATA

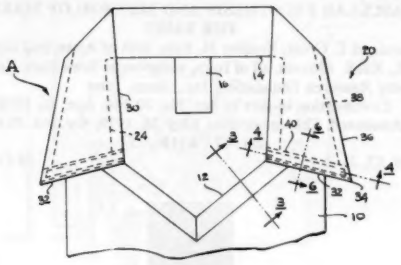
For CLASS	See PATENT NO.
411–441	4,286,496
369–244	4,286,789
369–036	4,286,790
585–006	4,287,074
106–039	4,287,075
369–045	4,287,413

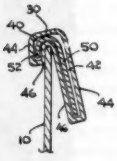
PATENTS

GRANTED SEPTEMBER 1, 1981

GENERAL AND MECHANICAL

4,286,337
SHAPE RETAINING COLLAR DEVICES AND ARTICLES OF WEARING APPAREL USING SAME
Edmond A. Malouf, Jr., 13440 Tiara St., Van Nuys, Calif. 91401
Filed Sep. 24, 1979, Ser. No. 78,553
Int. Cl.³ A41B *1/14*
U.S. Cl. 2—116 **15 Claims**





1. A shape retaining collar device for use with garments of wearing apparel including a torso covering segment, said shape retaining collar device comprising:

(a) a first fabric portion attachable to said torso covering segment and which first fabric portion is generally non-exposable to a viewer,

(b) a second fabric portion extending from said first fabric portion in the form of a collar extending around some of said first fabric portion, said second fabric portion having a pair of edges which are forwardly presented to a viewer of said collar, said first and second fabric portions being arranged so that the torso covering segment has an open neck area in the front of the garment such that a front portion of the neck of the user is exposed and which torso covering segment does not have a releasable fastening means in the neck-line region,

(c) a separate collar stay located at or in proximity to the forwardly presented edges of said second fabric portion and extending for at least the major portion of the dimension of said edges of said second fabric portion, said collar stays also being located so that they are parallel to the forwardly presented edges of the second fabric portion, and

(d) a tab extending from each said stay and extending along said first fabric portion at an acute angle with respect to said stays to enable said second fabric portion to establish an acute angle with said first fabric portion, said tabs also being parallel in at least one plane to the collar stays from which they extend.

7. A shirt construction comprising:

(a) a shirt body portion,

(b) a shirt collar on said body portion and forming a neckline to at least partially encircle the neck of a wearer, said collar having a pair of tips spaced apart from the neckline and a pair of edges with each extending from the neckline to the associated tip, said shirt body portion and shirt collar being arranged so that the shirt body portion and collar have an open neck area in the front of the shirt such that a front portion of the neck of a user is exposed and which shirt body portion does not have a releasable fastening means in the neckline region,

(c) retaining means to retain a collar stay with respect to said shirt collar at each of the pair of edges, and

(d) a separate collar stay retained by each said retaining means and extending along each said edge in close proximity to each said edge from said neckline, each said collar stay having a tab located at an acute angle with respect to said stay and which tab extends inwardly of said shirt collar at said neckline, each of said collar stays also being located so that they are parallel to the edges which are forwardly presented edges.

4,286,338
ADJUSTABLE PAPER CAP
Thomas P. Maney, 535 Greenglade Ave., Worthington, Ohio 43085
Filed Oct. 9, 1980, Ser. No. 195,479
Int. Cl.³ A42B *1/00, 1/22*
U.S. Cl. 2—197 **17 Claims**

11. An adjustable cap comprising first and second elongated side panels with respective opposite ends adapted to be disposed in co-extensive relationship with each panel having opposed upper and lower longitudinally extending edges, each of said first and second panels having a marginal edge portion at each longitudinally extending edge folded relatively inwardly thereof into superimposed relationship between said two panels, said upper and lower marginal edge portions overlapping with the upper edge portion projecting a distance downwardly to partially cover the lower edge portion,

said second panel being formed with a front section and a rear section extending in longitudinally aligned overlapping relationship with adjacent ends of the front and rear sections telescopically interconnected to permit relative longitudinal displacement thereof for selective size adjustment, said interconnected sections having the overlapping marginal edge portions of the one section telescopically positioned interiorly of the overlapping marginal edge portions of the other section, each of said front and rear sections having their opposite ends connecting with a respective end of said first panel, and

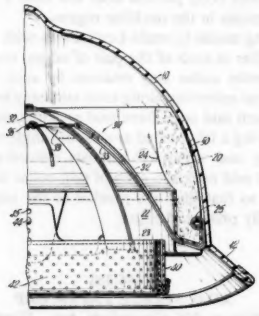
an elongated crown formed from flexible sheet material and having a plurality of longitudinally extending pleated panels with an outermost pleat panel at each side thereof secured to an inwardly facing surface of the innermost positioned marginal edge portion of said first and second panel, said pleated panels disposed in coplanar relationship to said side panels when said crown is collapsed to a fully folded configuration.

4,286,339

FIREMAN'S HELMET WITH ENERGY ABSORBING LINER

Peter A. Coombs, 62 Birkendene Rd., Caldwell, N.J. 07006

Filed Dec. 4, 1978, Ser. No. 966,397
Int. Cl.³ A42B 3/02
U.S. Cl. 2—414 **11 Claims**



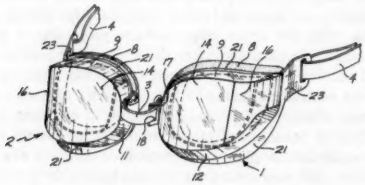
1. A fireman's helmet having an impact attenuation suspension comprising polymeric helmet shell, a non-resilient foam polymer liner in the form of a ring having an exterior conforming to the interior of the shell, a cradle of straps of webbing for engagement with the wearer's head under conditions of impact, said cradle comprising a plurality of straps arranged radially from a central apex outwardly and downwardly to the lower rim of the foam liner, about the rim and upwardly on the exterior of the foam liner, thence about a resilient member inset in a groove which encircles the exterior of the foam liner, thence downwardly and about the lower rim and toward the apex to a drawstring for adjustment of the cradle size, the lower rim of the foam liner being encased in a ring of channel cross-section formed of a relatively rigid polymer, and a headband secured to the foam liner for supporting the helmet on the wearer's head.

4,286,340

SWIM GOGGLES

Kim N. Lathrop, 1622 E. 56th Ave., Portland, Oreg. 97215

Filed Dec. 10, 1979, Ser. No. 101,819
Int. Cl.³ A61F 9/02
U.S. Cl. 2—430 **9 Claims**



1. In swim goggles including two eyepiece cups, nose strap means for connecting inner ends of such cups and head strap means for connecting outer ends of such cups and extending around the head of a wearer, the improvement comprising each eyepiece cup including a frame portion having an upper margin fittable into the upper portion of an eye socket of the wearer so that the eyepiece cup presents a hydrodynamically smooth transition between the wearer's eyebrow and the goggles, said eyepiece cup frame portion upper margin including a flange and a generally rounded transition portion between said flange and the remainder of the eyepiece cup to minimize discomfort to the wearer, and each eyepiece cup frame portion having a lower margin which generally conforms with the outer side of the cheekbone of the wearer at a location a substantial distance below its upper edge.

4,286,341

VASCULAR PROSTHESIS AND METHOD OF MAKING THE SAME

Raymond T. Greer; Bradley H. Vale, both of Ames, and Randall L. Knoll, Altoona, all of Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation-in-part of Ser. No. 30,146, Apr. 16, 1979, abandoned. This application May 23, 1979, Ser. No. 41,607
Int. Cl.³ A61F 1/24
U.S. Cl. 3—1.4 **34 Claims**

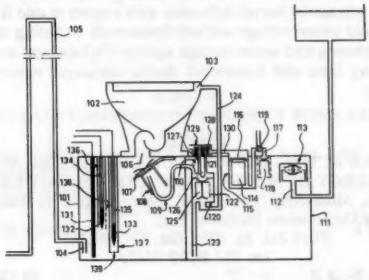
1. A vascular prosthesis comprising a flexible support tube having a porous homogenous hydrogel layer along the inside thereof and a porous heterogenous hydrogel layer along the outside thereof, said homogenous layer having pores of a maximum size less than 20 microns Feret diameter, and said heterogenous layer having pores of the same size as said homogenous layer and in addition having larger pores of a Feret diameter within the range of 20 to 200 microns.

22. A method for making a vascular prosthesis, comprising the steps of impregnating a porous flexible support tube with a polymerizable mixture of a monolefinic monomer and a minor proportion of a cross-linking agent dissolved in a first cosolvent medium comprising a first constituent in which both the monomer and polymer are readily soluble and a second constituent in which said monomer is soluble but said polymer is substantially insoluble, said second constituent exceeding 45% by weight of said polymerizable mixture, polymerizing said monomer in said first cosolvent medium to provide a cross-linked heterogenous hydrogel having a microstructure characterized by both microvoids and macrovoids, coating the interior of said tube with a second polymerizable mixture of the same monomer and cross-linking agent in a second cosolvent medium containing the same constituents as said first cosolvent medium but wherein said second constituent is less than 45% by weight of the polymerizable mixture, and polymerizing said monomer of said second mixture to produce a smooth hydrogel lining for said tube having a homogenous microstructure substantially free of macrovoids.

4,286,342
TOILET INSTALLATION

Alain Anthony, Parc Offenbach, 33, rue Cartault, 92800 Puteaux, France

Continuation-in-part of Ser. No. 760,397, Jan. 18, 1977, Pat. No. 4,179,048. This application Mar. 12, 1979, Ser. No. 19,646
Claims priority, application France, Sep. 28, 1978, 78 27808
Int. Cl.³ E03D *11/10;* **F16K** *31/12;* **E03D** *5/012, 5/02*
U.S. Cl. 4—321 **12 Claims**



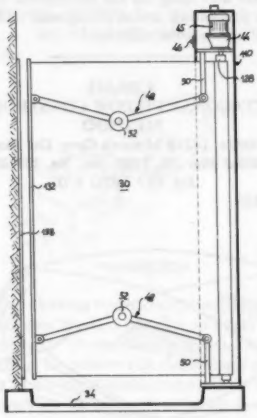
1. A toilet installation comprising a toilet fixture, a discharge tank disposed beneath said toilet fixture and having a drain orifice and an inlet orifice in communication with said fixture, an obturating member adapted to sealingly mate with the edge defining said inlet orifice to seal it off and a source of compressed fluid connected to said discharge tank through conduit means for pressurizing said discharge tank and expelling effluent including waste matter through the drain orifice, wherein the improvement comprises said obturating member having a pliable edge portion serving as a hinge to connect said obturating member to one side of said inlet orifice, and to permit said obturating member to hang into said discharge tank in open nonsealed relationship to said inlet orifice when the latter is unpressurized, said conduit means having an outlet end proximate to and aimed at said obturating member whereby a blast of fluid issuing from said conduit means outlet end thrusts said obturating member back and urges it against the edge of said inlet orifice to sealingly close the latter.

4,286,343
PARTITION-WALL ARRANGEMENT

Bruno Lampka, im Steinbichl 3, 8960 Kempton, Fed. Rep. of Germany

Filed Mar. 5, 1980, Ser. No. 127,532
Int. Cl.³ A47K *3/22*
U.S. Cl. 4—596 **8 Claims**

1. A partition arrangement for bath or shower tubs installed in room corners characterized by a hollow post mountable on that corner of the tub which is diagonally opposed to said room corner and provided with a pair of flexible partition walls in the inner chamber of the hollow post; at least one vertical slit provided in one wall of the hollow post; at least one vertical shaft rotatably mounted in the chamber of the hollow post; at least one of said pair of flexible partition walls being fastened at and wound on said vertical shaft and being passed through said vertical slit; at an end portion of said flexible partition wall projecting out of the hollow post a vertical bar being fastened covering said vertical slit when the partition wall is wound up; the rotatable shaft being provided with means for winding up that partition wall; both partition walls of said pair of partitions walls being extractable rectangularly with respect to one another; an adjusting device arranged at the upper and/or lower end of the hollow post for changing

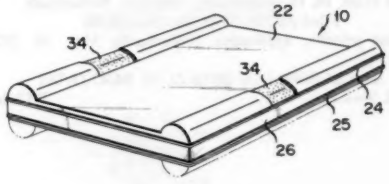


the overall length thereof and a room ceiling fastening plate at the upper end of the post or the upper adjusting device thereof.

4,286,344
MATTRESS

Minoru Ikeda, Kokubunji, Japan, assignor to France Bed Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1979, Ser. No. 105,929
Claims priority, application Japan, Oct. 22, 1979, 54-136266; Nov. 6, 1979, 54-154004[U]; Nov. 6, 1979, 54-154005[U]; Nov. 6, 1979, 54-154006[U]
Int. Cl.³ A47C *23/04*
U.S. Cl. 5—424 **10 Claims**



1. A mattress for preventing a user lying thereon from falling from the mattress, comprising:

a spring unit (**12**) including a plurality of coil springs arranged in parallel with one another;

an elastomeric layer (**18**;**19**) disposed at least on one of the top and bottom of the spring unit (**12**) and wrapped with an outer covering (**20**; **22**,**23**), whereon a user is to lie;

fall preventing means disposed at least on the top side of the elastomeric layer, said fall preventing means including a pair of ridges (**34**) of elastomeric material extending in the longitudinal direction of the elastomeric layer and protruding from the elastomeric layer, each ridge (**34**) of said fall preventing means having a sectional shape including a partial circle and being harder than the elastomeric layer, and each ridge of said fall preventing means being interposed between the outer covering (**20**; **22**,**23**) and the elastomeric layer (**18**;**19**); and

connecting means (**30**,**31**; **42**) one end of which is connected to the outer covering (**20**;**22**, **23**) and the other end of which is connected to the coil springs of the spring unit

(12), each ridge (34) being fixed to said connecting means intermediate the connection to the outer covering and the connection to the coil springs;

whereby the user lying on the elastomeric layer on which said fall preventing means is disposed will be prevented from falling from the mattress.

4,286,345

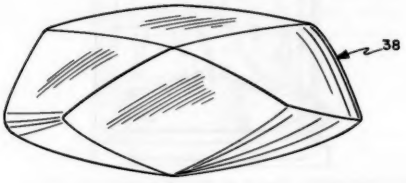
QUASI-OCTAGONAL PILLOW CONSTRUCTION AND METHOD

Maxine H. Maher, 14219 Minorca Cove, Del Mar, Calif. 92014

Filed Mar. 18, 1980, Ser. No. 131,282

Int. Cl.³ A47G *9/00*

U.S. Cl. 5—434 **11 Claims**



1. A pillow construction comprising:

four parallelogram shaped panel pieces having edges longer than their ends,

the first end of each panel being joined along a first side of an adjacent panel with the edge of a first side of such panel being in alignment with the edge of a first end of an adjacent panel,

each panel being folded and the second side of each panel being joined to the first side and the second end of an adjacent panel.

4,286,346

BOAT SLIPWAY FOR MOBILE OR FIXED SET-UP

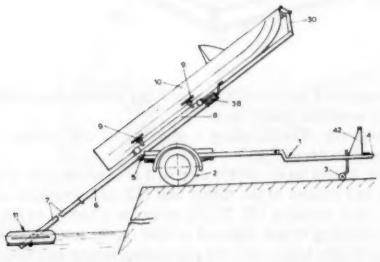
Eduard Wiek, 16, Horstlindelaan, Enschede, Netherlands

Filed Jul. 19, 1979, Ser. No. 58,956

Claims priority, application Netherlands, Mar. 28, 1979, 7902412

Int. Cl.³ B60P *3/10*; B63B *21/64*; B63C *13/001*

U.S. Cl. 9—1.2 **7 Claims**



1. Mobile or fixed boat slipway apparatus, comprising a framework having means for supporting a boat, said framework supported for pivotal movement between a substantially horizontal position when a boat is supported thereby and an inclined position for facilitating the launching or landing a boat from the slipway into and out of the water, said framework mounted to be freely pivotable around a support shaft and including a slide mounted for telescopic movement in a longitudinal direction along the length of said framework, said telescopic slide having an outer end portion which is projectable outwardly from the framework, at least one buoyant element for supporting said end portion of said slide from the water, and means for selectively adjusting the buoyant force of said element so that said end portion of said slide may be submerged in the water when a boat is launched or taken out of the water, said slide including means supporting an undercarriage for a boat mounted to travel longitudinally along said framework in telescopic relation thereto, said undercarriage supported on said framework by means of at least two pairs of spaced apart flanged rollers for guiding said undercarriage against substantial lateral deflection with respect to said framework, said undercarriage and said framework including means for restraining said undercarriage against displacement normal and away from said framework during telescopic movement thereon.

4,286,347

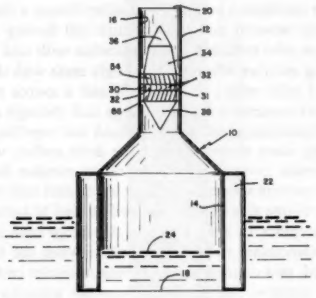
DOUBLE ACTING TURBINE FOR CONVERTING WAVE ENERGY OF WATER TO ELECTRICAL POWER

Jerry L. Modisette, Nassau Bay, Tex., assignor to Tideland Signal Corporation, Houston, Tex.

Filed Jul. 22, 1974, Ser. No. 490,567

Int. Cl.³ B63B *21/52*

U.S. Cl. 9—8 R **21 Claims**



1. An apparatus for converting the wave energy of water to electrical power comprising,

a tubular body, one end of which is adapted to be inserted into water waves and the second end adapted to extend out of the water whereby the rise and fall of water in the body creates a flow of air in alternate directions through the body,

a turbine wheel having a plurality of outwardly extending blades positioned in the body above the water level and exposed to and rotated by the flow of air,

an electrical generator connected to the turbine wheel for generating electricity in response to the rotation of the wheel,

the cross-sectional shape of the blades being shaped to provide an air flow passageway between adjacent blades which decreases in area from each edge thereby forming a restriction in the passageway between the blade edges whereby the wheel will rotate in a single direction regardless of the direction of flow of the air through the body.

10. An apparatus for converting sea wave energy into electrical energy, comprising

a buoy which moves with respect to the wave surface;

an air chamber in said buoy;

a hydraulic piston in said buoy;

a turbogenerator for converting the airflow kinetic energy into electrical energy;

a turbine stage including rigidly fixed blades in said turbogenerator;

a stator including rigidly fixed blades of said turbine stage;

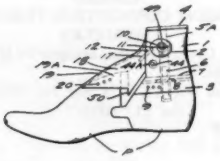
a rotor of said turbine stage, disposed downstream of said stator with respect to the direction of airflow;
a supplementary stator including rigidly fixed blades of said turbine stage, disposed downstream of said rotor with respect to the direction of said airflow;
a generator of said turbogenerator;
also mounted whereon is said rotor of said turbine stage;
an air duct for said air chamber to communicate with said turbogenerator.

4,286,348

SHOE LAST CONVERSION ASSEMBLY FOR LASTING BOOTS

Thomas P. White, Sr., 159 King St. East, Saint John, N. B., Canada (E2L 1G9)

Filed Sep. 5, 1979, Ser. No. 72,787
Int. Cl.³ A43D *3/00*
U.S. Cl. 12—133 R **4 Claims**



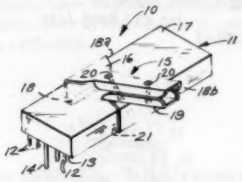
1. For lasting boots and similar footwear having an upper that preferably does not, although may cover but not engage the wearer's medial and lateral malleoli, if covering is preferred of said malleoli,
and for converting to such purpose a conventional shoe last which includes a forepart articulably joined to a backpart at a juncture region which includes a V-notch to permit articulation of the forepart relative to the rearpart for removal of the shoe last from a footwear upper formed thereabout; the forepart including a cone portion; and the backpart terminating at an upper end which lies below the malleoli;
an adapter assembly, comprising:
an upward extension for the backpart, including a medial vertical shoe last extension member and a lateral vertical extension member grouped together; means adjustably disposing the medial and lateral shoe last extension members adjustably fixed in lateral adjacency with a variable distance therebetween;
means for removably mounting the extension on the backpart so that the shoe last extension members extend above the malleolian level;
said shoe last extension including a skirt which, when the shoe last extension is mounted in place extends down around the exterior of the shoe last for part of the height of the shoe last;
a cone sub-assembly including a medial side portion, a lateral side portion and means for adjustably fixing these portions in lateral adjacency with a variable distance therebetween; the cone sub-assembly being externally configured at the bottom rear thereof to fit into the V-notch of the shoe last juncture region; the cone sub-assembly including a hood;
means for securing the cone-sub-assembly to the shoe last extension so that the cone sub-assembly hood at least partially covers-over the shoe last cone as a functionally somewhat enlarging structure therefor.

4,286,349

BROILER GRILL CLEANING BRUSH

Ernest Dugrenier, Box 2755, Road 124, West Sacramento, Calif. 95691

Filed Oct. 31, 1979, Ser. No. 90,010
Int. Cl.³ A46B *15/00*
U.S. Cl. 15—111 **3 Claims**



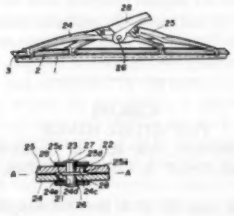
1. A broiler grill cleaning brush, comprising, in combination, a rectangular wooden block, a plurality of brush wire bristle clusters and a plurality of steel pegs embedded in said block, and protruding from the bottom side thereof; said pegs being in a straight row along a longitudinal center of said block, while said bristle clusters are on each opposite side portion of said block bottom side, separated by said peg row, and said pegs protruding further than said bristle clusters from said block.

4,286,350

WINDSCREEN WIPER BLADE

Yoshiju Ichise, Urawa, Japan, assignor to Nippon Wiper Blade Co., Ltd., Saitama, Japan

Filed Nov. 30, 1979, Ser. No. 99,027
Claims priority, application Japan, Nov. 30, 1978, 53-165246[U]; Apr. 4, 1979, 54-44259[U]
Int. Cl.³ B60S *1/40*
U.S. Cl. 15—250.32 **8 Claims**

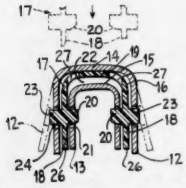


1. A windscreen wiper blade assembly comprising:
a rubber element for wiping a windscreen;
a backing strip connected to said rubber element;
a pair of yokes, said yokes having opposite ends, one end of one yoke being connected to one end of said backing strip and the opposite end of the other yoke being connected to the other end of the backing strip thereby attaching said yokes to said rubber element;
each one of said yokes having a surface portion defined intermediate said opposite ends such that the surface portions face one another;
each surface portion having a corresponding bore therethrough; and
a connecting means having a connecting pin which slidably engages the inner periphery of each of the corresponding bores for pivotably connecting said yokes and allowing for relative rotational movement of said yokes and pin elements integrally connected to said connecting pin and respectively engaging said yokes for restricting relative rotational movement of said yokes.

4,286,351
WIPER BLADES FOR VEHICLES

Peter Mower, Iwickenham, and John H. Gadd, Sunningdale, both of England, assignors to Trico Products Corporation, Buffalo, N.Y.

Filed Dec. 10, 1979, Ser. No. 102,024
Claims priority, application United Kingdom, Dec. 12, 1978, 48088/78; Aug. 6, 1979, 27319/79
Int. Cl.³ B60S *1/38*
U.S. Cl. 15—250.42 **5 Claims**



1. In a wiper blade assembly comprising a harness having a primary yoke and at least one secondary yoke pivotally connected along its length to an end of the primary yoke at a joint therebetween, the yokes being of metal and each including a back portion, a pair of flanges extending down therefrom and being of similar cross section at said joint, the secondary yoke being disposed relative to the primary yoke so that the flanges thereof overlap the secondary yoke where they are pivotally connected at said joint between them, and a spacer of resilient plastics of similar cross-section to the yokes disposed between them at said joint to prevent metal-to-metal contact; the improvement wherein the spacer consists of a web and a pair of cheeks, each cheek having one of a pair of internally extending trunnions pivotally snap engaged in corresponding holes in the flanges of the secondary yoke, and the spacer cheeks each further being formed with one of a pair of externally extending projections which are aligned coaxially with the internal trunnions and engage in and extend through corresponding holes in the primary yoke flanges and hold the spacer and thereby the secondary yoke captive in the joint.

4,286,352
FURNITURE HINGE

Willi Pittasch, Herford, Fed. Rep. of Germany, assignor to Richard Heinze GmbH & Co. KG, Herford, Fed. Rep. of Germany

Filed Aug. 24, 1978, Ser. No. 936,247
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1977, 2739417
Int. Cl.³ E05D *7/04*
U.S. Cl. 16—130 **24 Claims**

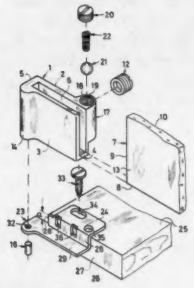
23. A hinge for pivoting and guiding a door on furniture comprising:

a hinge arm for attachment to said furniture and a hinge member for attachment to said door and being pivotally connected to the hinge arm by at least one pivot pin,

said hinge member being formed by a U-profile having two flanges with one of said flanges being positioned on the door outside face and visible when the door is closed and the other of said flanges being positioned on the door inside face and being behind the door when the door is closed.

a yoke connecting said flanges to each other and abutting a side face of the door, said two flanges of said U-profile, which encloses the door in form of a clamp, being connected to each other additionally by wall means at right angles to said flanges and said yoke,

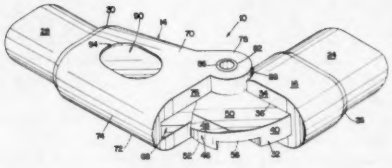
said hinge member having a first surface which is adjacent to a second surface of the hinge arm in the door closed position, one of these surfaces being provided with a ratchet surface and the other of these surfaces being provided with a resiliently urged ratchetting element which snap fits behind said ratchet surface.



4,286,353
MULTI-ELEMENT CONNECTION FOR STRUCTURAL MEMBERS

John N. Roche, Greenville, Pa., assignor to R. D. Werner Co., Inc., Greenville, Pa.

Filed Dec. 11, 1978, Ser. No. 968,211
Int. Cl.³ E05D *11/10*
U.S. Cl. 16—143 **9 Claims**



1. A multi-element connection for joining structural members secured thereto into an automatically locked co-linear arrangement, and adapted to be rotated or folded to bring the structural members into such co-linear arrangement from an unlocked configuration, said connection comprising:

(a) a latch member adapted to secure a structural member thereto, said latch member including an outwardly projecting latch tongue having a latching recess formed therein;

(b) a clevis member adapted to secure a structural member thereto, said clevis member including a clevis channel for receiving said latch tongue;

(c) pivot means joining said latch and clevis members in rotary reciprocable engagement, whereby said latch tongue is received in said clevis channel in a closed and locked configuration, and is pivotally displaceable to an open and unlocked configuration along an arcuate path;

(d) latch means reciprocably received in said clevis member and transversely displaceable with respect to said path from a latched configuration, wherein said latch means projects into said path, to an unlatched configuration, wherein said latch means is displaced proximally away from said path, said latch means including latch pin means for engaging said latching recess;

(e) said latch tongue being a generally wedge-shaped tongue having a first radial edge coincident with an abutment end wall of said latch plate member and a second radial edge at the distal end thereof, said radial edges joined by an arcuate edge, said latch tongue further including a camming surface at said distal end for displacing said latch

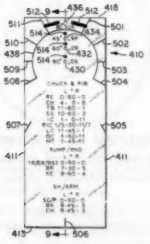
means from said latched to said unlatched configurations as said latch tongue is pivoted from said open to said closed configurations.

4,286,354

MEAT GRAIN TEMPLATE

Robert S. Weinhaus, 868 Albey La., St. Louis, Mo. 63132

Filed May 22, 1979, Ser. No. 41,492
Int. Cl.³ A22C *17/10, 17/02*
U.S. Cl. 17—1 R **11 Claims**



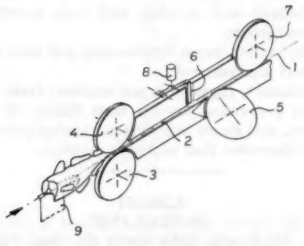
1. A meat grain template comprising:
(a) a body including a lower face and a plurality of continuous wall passages inclined at selected angles having a vertical component relative to said lower face, and
(b) each passage being substantially straight for receiving and directing a meat grain marker into a piece of meat disposed below the lower face.

4,286,355

METHOD OF FILLETING FISH AND A FILLETING MACHINE FOR PERFORMING THIS METHOD

Horst K. H. Braeger, Lübeck, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. Baader GmbH & Co. KG, Lübeck, Fed. Rep. of Germany

Filed Jun. 1, 1979, Ser. No. 44,713
Int. Cl.³ A22C *25/16*
U.S. Cl. 17—46 **5 Claims**



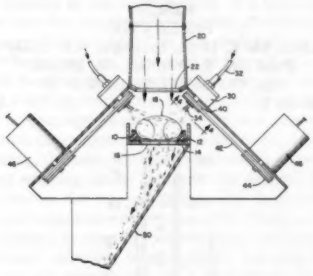
1. A method of filleting fish comprising the steps of:
conveying the fish tail forwards toward a series of cutting knives,
performing back filleting cuts through the upper portion of the fish along the length thereof, and performing belly filleting cuts through the lower portion of the fish in the tail portion thereof up to a location close to the rear end of the belly cavity of the fish, with said back filleting cuts and belly filleting cuts terminating short of the vertebral column of the fish and leaving a flesh strip on both sides of the vertebral column,
thereafter performing first severing cuts through the upper portion of the fish along the sides of the vertebral column in a region rearwardly of the tail end of the cavity of the fish, to sever said flesh strip from both sides of the vertebral column in said region,
thereafter performing rib cuts through the sides of the fish through said region and above the length of the belly cavity, with said rib cuts extending upwardly to the ends of the back filleting cuts,
and finally performing second severing cuts along both sides of the vertebral column from the tail root of the fish to the end of the belly cavity to sever the fillets completely from the skeleton of the fish.

4,286,356

MACHINE FOR REMOVING MEAT FROM PREPARED CRAB BODIES

Richard T. Wenstrom, Ellsworth, Me., assignor to Sea Savory, Inc., Cambridge, Md.

Filed Aug. 29, 1979, Ser. No. 70,736
Int. Cl.³ A22C *29/02*
U.S. Cl. 17—46 **5 Claims**



1. A machine for removing the meat from a crab body which has been prepared by removal of the carapace, claws, flippers and viscera leaving the two sections of meat separated by the visceral cavity and connected by the bottom shell comprising a work station, means for supporting a prepared crab body, means for moving the support below the work station with the prepared crab body hereon, and air jet means positioned above and outside the support means for directing air under pressure in a downward and inward direction toward both of the sections of crab meat, and means for rotating each the air jets in a circular path adjacent and encompassing the meat to be removed.

4,286,357

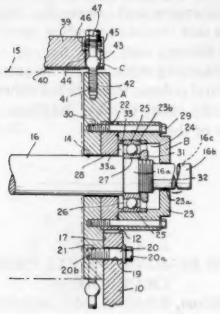
CARD CYLINDER SHROUD, FLAT MOUNTING AND BEARING ASSEMBLY

John E. Harrison, Sr., Greenville, S.C., assignor to John D. Hollingsworth on Wheels, Inc., Greenville, S.C.

Division of Ser. No. 824,288, Aug. 15, 1977, Pat. No. 4,198,729.
This application Jun. 6, 1979, Ser. No. 45,993
Int. Cl.³ D01G *15/32*
U.S. Cl. 19—98 **9 Claims**

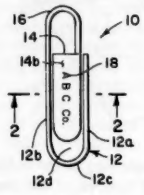
1. A mounting assembly for stationary flats for a carding machine having a clothed cylinder and an arcuate mounting surface comprising:
a pair of upright spaced threaded elements carried for threadable adjustment adjacent an end portion of each flat bearing upon said arcuate mounting surface;

pivotal means securing said flat to said arcuate mounting surface intermediate said spaced threaded elements; and



resilient means aligned with said pivotal means yieldably urging said flats toward said arcuate mounting means.

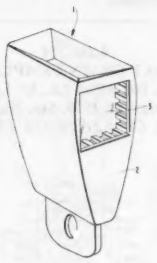
4,286,358
PAPER CLIP
Gary M. Levin, 940 E. 19 St., Brooklyn, N.Y. 11230
Filed Dec. 5, 1979, Ser. No. 100,445
Int. Cl.³ B42F *1/02*; G09F *3/16*
U.S. Cl. 24—67 R **15 Claims**



1. In a paper clip of the type formed of a single length of wire having opposite end portions bent into a U-shaped configuration to provide two distinct yet cooperating U-shaped gripping jaws, the improvement comprising a planar land disposed within the planar void that defines one of the gripping jaws, said planar land being formed with the respective wire sections defining said one gripping jaw whereby said planar land and jaw are formed from a single piece thereby monolithically to define a thin plate-like clamping plane that substantially fills the void.

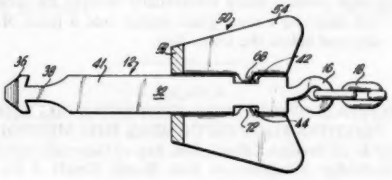
4,286,359
PUSH BUTTON, ESPECIALLY FOR LOCKS OF SAFETY BELTS
Hans O. Scherenberg; Werner Breitschwerdt, both of Stuttgart; Wilhelm Klein, Aidlingen, and Walter Jahn, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany
Filed Sep. 27, 1976, Ser. No. 726,560
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1975, 2543263
Int. Cl.³ A44B *19/00*; A47C *31/00*
U.S. Cl. 24—230 R **6 Claims**

1. A push button for locks whose top side is at most flush with a housing of the lock receiving the same, characterized in that the lateral guide surfaces of the push button and the corresponding guide surfaces in the lock housing are non-circular in transverse cross-section and are provided with a large number of projecting and recessed areas which are sized to prevent



access by a user's fingernail to a clearance space formed between said projecting and recessed areas.

4,286,360
JEWELRY CLASP
Max Skobel, Edison, N.J., assignor to Laurel Enterprises, Rahway, N.J.
Filed Mar. 10, 1980, Ser. No. 128,839
Int. Cl.³ A44C *5/18*; A44B *17/00*
U.S. Cl. 24—230 R **10 Claims**

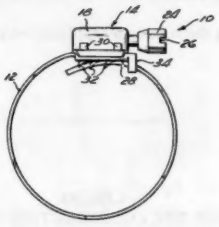


1. A jewelry clasp comprising:
a female member having an opening therein;
a male member adapted to be inserted into said female member through said opening, said male member having notches therein;
releasable locking means for clamping said male and female members together; and
means releasably engaging in said notches of said male member for preventing jewelry from sliding off said male member, said means including a retaining guard having a larger dimension than said male member.

4,286,361
HOSE CLAMP
Donald R. MacKenzie, 6443 Menlo St., Simi Valley, Calif. 93063
Filed Aug. 11, 1980, Ser. No. 176,825
Int. Cl.³ B65D *63/02*
U.S. Cl. 24—276 **3 Claims**

1. A hose clamp comprising:
a flexible band, said band having a series of evenly spaced apart openings;
a clamping mechanism having a housing, said housing having an inner exterior surface within which is formed a protruding member assembly, said inner exterior surface terminating longitudinally in a fore end and an aft end, said protruding member assembly being spaced from said fore end, said protruding member assembly to connect with at least one of said openings at one end of said band thereby fixing the position of said band relative to said

housing, a worm screw rotatably mounted upon said housing, said worm screw to engage at least one of said openings at the other end of said band, said other end of said band being located between said worm screw and said protruding member assembly, whereby turning of said worm screw causes relative movement between said



one end and said other end and varying of the size of the enclosed area of said band; and

a guide bracket assembly, said guide bracket assembly being attached to said housing at said fore end, said band to extend through said guide bracket assembly to guidingly locate and position said protruding member assembly within said openings of said band.

4,286,362

LIGHTWEIGHT LAMINATED GRID FOR LEAD ACID-STORAGE BATTERIES

Richard H. Hammar, Fraser, and Douglas J. Harvey, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 10,898, Feb. 9, 1979, Pat. No. 4,221,854. This application Jan. 28, 1980, Ser. No. 116,362

Int. Cl.³ H01M *4/72, 35/04*

U.S. Cl. 29—2 **3 Claims**

1. A method of making a lightweight laminated grid for a lead-acid storage battery comprising the steps of:

providing a trilaminate sheet comprising a support layer of a synthetic polymeric plastic bonded to a coextensive layer of lead or lead alloy foil by an interposed layer of adhesive;

forming a plurality of straight, parallel rows of intermittent slits through the thickness of said sheet, the spacing between said rows ultimately defining grid wire portions and the spacing between the slits of a said row ultimately defining node portions which interconnect said wire portions; and

stretching said sheet to open said slits and form an open mesh network of grid wire portions and interconnecting nodes, and twisting the network such that the foil layer forms ledges which face the grid header for holding battery paste.

4,286,363

METHOD OF ASSEMBLY FOR A BALL AND SOCKET JOINT

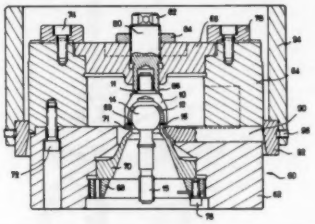
Gerard Morin, Libiaire, France, assignor to Societe Anonyme D.B.A., Drancy, France

Filed Jan. 4, 1980, Ser. No. 109,717

Claims priority, application France, Jan. 17, 1979, 79 01060

Int. Cl.³ B21D *53/10*

U.S. Cl. 29—149.5 B **4 Claims**



1. Method of assembly for a ball-and-socket joint, in particular for suspension or steering of an automobile vehicle comprising a housing in the general shape of a basin in which a blind bore receives components consisting of a bearing element of plastics material disposed in the said bore and bearing against the bottom of the latter, a pivot presenting a shank and a spherical head resiliently covered by the said bearing element, and a locking ring mounted in the said bore and applied at its internal face against the bearing element, characterised in that, the various components of the joint having been disposed in the housing, the assembly thus constituted is placed on a tool comprising stressing means acting on the external face of the ring to compress the bearing element and progressively load the joint until a predetermined value of the tilting torque of the pivot is obtained in relation to the housing, and once the said predetermined value has been obtained, the axial load exercised by the said stressing means is maintained and one then folds back towards the axis of the housing all or part of the extreme edge of the latter with the aid of means acting radially on the said edge so as to trap the ring in the bore without altering the predetermined value of the tilting torque.

4,286,364

METHOD OF ORIFICE FITTING MECHANISM FOR PIPELINES

Walter L. Connolly, 133 Danefield Pl., Moraga, Calif. 94556

Division of Ser. No. 923,023, Jul. 10, 1978, Pat. No. 4,191,216. This application Sep. 10, 1979, Ser. No. 74,239

Int. Cl.³ F16K *27/10;* **B23K** *31/00*

U.S. Cl. 29—157.1 R **4 Claims**

1. A method of fabricating an orifice fitting structure including restricted opening means for passage of an orifice plate carrier and having closely spaced internal hubs defining opposed sealing surfaces for engagement by the sealing element of the orifice plate carrier and wherein internal and external welds between the various structural components are necessary for high pressure service conditions, said method comprising:

forming a basic pressure containing orifice fitting body structure by connecting a plurality of generally rectangular body plates by means of external weld connections, said body structure defining a rectangular access opening and opposed openings through which fluid flows;

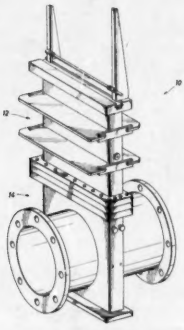
extending welding apparatus through said access opening and forming internal weld connections between said body plates;

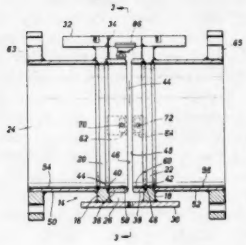
locating internal hub rings within said body structure in such manner as to position opposed end faces of said hub rings in parallel closely spaced relation and to position inner

portions of said hubs about said opposed openings for welded connection to selected ones of said body plates;

extending welding apparatus through said opposed openings and forming welds between the selected body plates and hub rings;

positioning conduit sections in assembly with selected ones of said body plates defining intersection therebetween and in registry with said opposed openings;





extending welding apparatus through said conduit sections and connecting said conduit sections to the external portion of said selected body plates by means of internal welds; and

making external welds at the intersection of said conduit sections and body plates.

4,286,365

HEAT EXCHANGERS

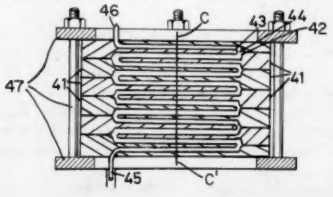
Gordon R. Creighton, Cambridge, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 553,868, Feb. 27, 1975, abandoned. This application Jul. 29, 1976, Ser. No. 709,831

Claims priority, application United Kingdom, Mar. 14, 1974, 11312/74

Int. Cl.[3] B23P *15/26*

U.S. Cl. 29—157.3 V **15 Claims**



1. A method of making a heat exchanger consisting of a conduit having a plurality of passes joined by integral return bends which consists essentially of, in sequence,

(i) bending two strips of pliable material together in a zigzag manner to form a stack of parallel passes, the two strips being displaced laterally with respect to one another,

(ii) bonding the two strips together along lines parallel to their longitudinal edges to form a flat, serpentine conduit, and

(iii) inflating the conduit by applying internally a fluid under pressure.

4,286,366

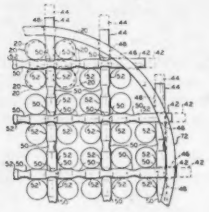
METHOD FOR THE CONSTRUCTION OF A BAFFLED HEAT EXCHANGER

Roy E. Vinyard, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 864,122, Dec. 23, 1977. This application Mar. 5, 1980, Ser. No. 127,275

Int. Cl.[3] B23P *15/26*

U.S. Cl. 29—157.4 **6 Claims**



1. A method of assembly of heat exchange tube bundle comprising a plurality of tubes, at least one outer ring, a plurality of rods supportable by each outer ring, each of said rods having at least one first region of reduced thickness providing means for allowing movement of a tube adjacent said first region in a first position of each of said rods to facilitate assembly of said tube bundle and each of said rods having at least one second region of increased thickness adjacent to a corresponding first region of reduced thickness and providing means for firmly engaging and preventing movement of a tube adjacent said second region in a second position of each of said rods. and at least one tube sheet, comprising the steps of:

a. supporting a first plurality of said rods in a first position across each outer ring in spaced mutually parallel relation;

b. supporting a second plurality of said rods in a first position across each outer ring in spaced mutually parallel relation, the common axis of alignment of said second plurality of rods being substantially normal to the common axis of alignment of said first plurality of rods;

c. inserting a plurality of said tubes through each of said outer rings in spaced mutually parallel relation, the common axis of alignment of said tubes being substantially normal to the common axis of alignment of said first plurality of rods and to the common axis of alignment of said second plurality of rods, each tube being positioned proximate one of said first plurality of rods and one of said second plurality of rods in each outer ring;

d. securing the outer ends of said tubes to a tube sheet; and

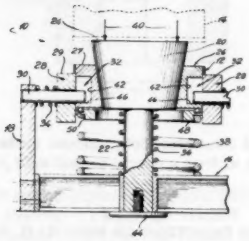
e. moving the first and second pluralities of rods in at least one of said outer rings from the respective first positions thereof to respective second positions thereof and thereby firmly engaging the respective tubes proximate thereto.

4,286,367

APPARATUS FOR INSERTING A RESILIENT BAND ON A CONTAINER

Wolfgang Geisinger, 180 rue Paradis, Rosemere, Quebec, Canada

Filed Mar. 18, 1980, Ser. No. 131,412
Int. Cl.³ B23P 19/02
U.S. Cl. 29—235 6 Claims



1. In combination with a container and a resilient band, an apparatus for inserting said band on said container adjacent one peripheral end thereof, comprising: a support member adapted to receive thereon said container and adapted to be forced downward by said container, said support member having a tapered side wall and a top wall of a size smaller than that of the peripheral end of said container; a first set of segments arranged circumferentially about said support member, each segment having a top wall extending below said top wall of said support member and an inner wall in sliding contact with said side wall of said support member, said segments being radially displaceable relative to said support member as said support member is forced downward; a second set of segments arranged circumferentially about said first set of segments, each segment of said second set having a top wall extending below the top wall of the segments of said first to define therewith a band-receiving area; means urging said second set of segments exteriorly against said first set of segments; first spring means opposing downward movement of said support member; second spring means opposing downward movement of said first set of segments, said second spring means having a spring modulus higher than that of said first spring means whereby downward movement of said container on said support member causes, first, a radial movement only of said first set of segments to stretch said band located in said band-receiving area until said container contacts said first set of segments whereupon said first set of segments moves downward within said second set of segments and the stretched band moves in engagement with the said container adjacent said peripheral end.

4,286,368

FREEZE PLUG EJECTOR AND INJECTOR

Joseph Magana, 6607 S. Loch Alene Ave., Pico Rivera, Calif. 90660

Filed Dec. 3, 1979, Ser. No. 84,096
Int. Cl.³ B23P 19/04
U.S. Cl. 29—267 1 Claim

1. Apparatus for removing a freeze plug from an automotive engine block mounted within automotive vehicle walls, comprising:

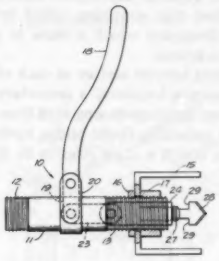
hollow open-ended pipe means having threaded end portions and a slotlike opening in a sidewall;

a generally C-shaped member having a threaded opening received onto one end of the pipe means with both arms of the member extending outwardly of the pipe means end;

a handle having an end portion extending through the slotlike opening in the pipe means with the remainder of the handle extending outwardly thereof;

a strap clamped about the pipe means and pivotally interconnected with the handle;

elongated means pivotally connected to the end of the handle within the pipe means and extending towared the pipe means end carrying the C-shaped member; and



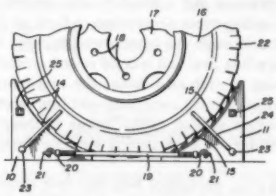
a generally pointed, platelike spear means interconnected with the elongated means and extending outwardly of the pipe means.

4,286,369

TIRE MOUNTING GUIDES

Andrew Fusco, 52 Winchester Ave., Youngstown, Ohio 44509

Filed Apr. 7, 1980, Ser. No. 137,646
Int. Cl.³ B25B 27/14
U.S. Cl. 29—273 4 Claims



1. A tire mounting guide comprising a pair of oppositely disposed wedged shaped body members, each having a flat base and spaced vertical sides and an outwardly and upwardly curving concave member positioned therebetween so as to form a tire engaging surface, a plurality of rollers positioned transversely in one of said concave members and a plurality of pointed members formed on the other of said concave members, said pointed members being directed upwardly with respect to said concave member on which they are positioned, fasteners on the opposite sides of each of said wedge shaped body members and a pair of resilient cords secured at their opposite ends to said fasteners so as to enable said resilient cords to urge said oppositely disposed wedge shaped body members toward one another in supporting relation to a wheel and tire disposed thereon.

4,286,370

UNIVERSAL JOINT FLEXURE HINGE SUSPENSION SYSTEM, AND METHOD FOR MANUFACTURING THIS SYSTEM

Robert J. G. Craig, Malibu, Calif., assignor to Incosym, Inc., Westlake Village, Calif.

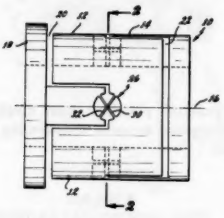
Continuation of Ser. No. 822,384, Aug. 5, 1977, abandoned. This application May 19, 1980, Ser. No. 150,742
Int. Cl.³ B23P 1/00; G01C 19/18
U.S. Cl. —434 12 Claims

1. A method for making a monolithic flexure hinge suspension system for a tuned inertial instrument, comprising the steps of:

(a) mounting on a mandrel, an axially extended workpiece having an axis and an axial hole extending at least partly therethrough, defining a bounding wall having an interior surface and an outside surface;

(b) forming in said outside surface at each of two diametrically opposite locations of said workpiece an original, two complemental, adjacent depressions separated from each other by a first thin remaining raised bridge having a longitudinal dimension which is skew in relation to the axis of the workpiece;

(c) forming in said interior surface at each of said two diametrically opposite locations, a secondary two complemental adjacent depressions separated from each other by a second thin remaining raised bridge having a longitudinal dimension which is skew relative to, and crosses the



like dimension of said first raised bridge, and which is skew in relation to the axis of the workpiece;

(d) extending at each of said locations a predetermined one of the primary and secondary depressions to meet the corresponding other depressions to form, at each location, an orifice through the tubular wall bridged across by the corresponding first and second raised crossed bridges;

(e) removing in each said orifice the remaining material of the workpiece interconnecting said first raised bridge and its proximate second raised bridge to make the crossed raised bridges in each orifice separate from each other; and

(f) cutting said workpiece between said diametrically opposed orifices to form two substantially co-axial, cylindrical tubes, monolithically and integrally connected only by said separated, skew, raised crossed bridges.

4,286,371

CONTINUOUS CURVE COUNTERSINK AND RIVET HEAD STRUCTURE FOR RIVETED WORK PIECES

Joseph G. Falcioni, Tacoma, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 865,933, Dec. 30, 1977, Pat. No. 4,245,921, which is a continuation-in-part of Ser. No. 755,834, Dec. 30, 1976, Pat. No. 4,111,580. This application Mar. 10, 1980, Ser. No. 128,512

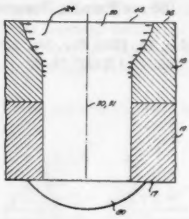
Int. Cl.³ B21D *39/00*; B23P *11/00*

U.S. Cl. 29—509 **7 Claims**

1. A process for riveting workpieces together comprising the steps of:

forming an aperture through said workpieces said aperture including a bore and having a countersink adjacent a first surface of one of said workpieces, said countersink comprising a continuously curved surface extending from said first surface of said workpiece to said bore, said countersink having a concave portion extending from said first surface toward said bore and having a convex portion extending from said concave portion to said bore;

placing a rivet blank to said bore and countersink; and



upsetting said rivet blank into intimate contact with said countersink to form a structural fluid-tight joint.

4,286,372

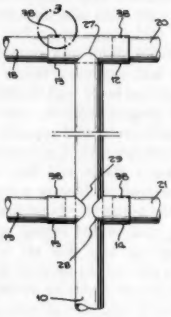
METHOD OF ERECTION OF PIPE RAIL JOINTING SYSTEM

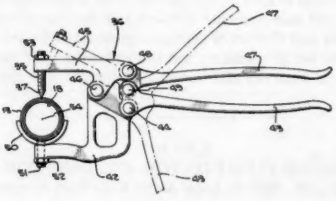
Roy W. Batcheller, West Covina, Calif., assignor to CraneVeyor Corporation, South El Monte, Calif.

Filed Nov. 16, 1979, Ser. No. 94,711

Int. Cl.³ B21D *39/00*; B23P *11/00*

U.S. Cl. 29—516 **1 Claim**





1. A method for erection on the site of a pipe rail jointing system comprising posts for successive vertical attachment to the site at horizontally spaced intervals, said posts having horizontal sleeves extending radially outward from exterior faces of said posts in a horizontal direction, and rails for engagement with said sleeves at respective ends of the rails, said method comprising cutting said rails at the site to respective lengths greater than the distance between respective sleeve ends to provide an overlap in the sleeve of about twice the rail diameter and a length less than the distance between faces of the posts on which the respective sleeves are located, adjusting posts and rails with respect to each other in final position, and attaching each sleeve to the adjacent end of the respective rail

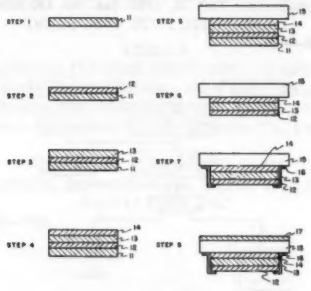
by progressively pressing a punch with a pointed end into the sleeve at the overlap portion while supporting the sleeve on the side opposite the punch throughout about one-half the circumference, thereby forming a shallow rounded depression on the outside of the pipe rail receptive of a complementary portion of the sleeve and a sharp depression on the outside of the sleeve in diametrical alignment with said depression and at the location of the punch whereby to anchor the pipe rails to the posts as an assembly at the site.

4,286,373

METHOD OF MAKING NEGATIVE ELECTRON AFFINITY PHOTOCATHODE

William A. Gutierrez; Herbert L. Wilson, both of Woodbridge, and Edward M. Yee, Burke, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 8, 1980, Ser. No. 110,513
Int. Cl.³ H01L *31/18*
U.S. Cl. 29—572 **2 Claims**



1. A method of making a glass-sealed transmission mode gallium arsenide photocathode comprising the steps of:

(a) preparing a germanium seed crystal for epitaxial growth;

(b) epitaxially growing a p-doped gallium arsenide photoemitting layer onto the prepared germanium crystal using the metal alkyl-hydride vapor-phase process;

(c) epitaxially growing a p-doped gallium aluminum arsenide passivating layer onto said photoemitting layer using the metal alkyl-hydride vapor-phase process;

(d) depositing a suitable antireflection or interface layer onto said passivating layer;

(e) fusion bonding the antireflection or interface layer surface of the structure composed of seed crystal, photoemitting layer, passivating layer, and antireflection or interface layer to a glass faceplate that serves as the input window of the device;

(f) preferentially etching away the exposed germanium seed crystal to expose the photoemitting layer;

(g) applying ohmic contact to the periphery of said photoemitting layer for effecting electrical contact to the photocathode;

(h) applying a suitable glass/air antireflection coating on the exposed photon input side of the glass window; and

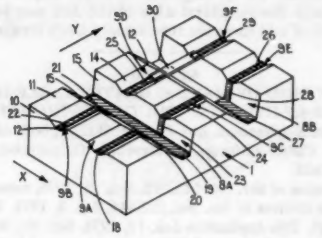
(i) activating the photoemitting layer by heat cleaning in vacuum and applying monolayer amounts of cesium and oxygen to the photoemitting layer.

4,286,374

LARGE SCALE INTEGRATED CIRCUIT PRODUCTION

Gerald H. Hantusch, Cheadle, England, assignor to International Computers Limited, Stevenage, England

Filed Feb. 11, 1980, Ser. No. 120,649
Claims priority, application United Kingdom, Feb. 24, 1979, 06622/79
Int. Cl.³ H01L *21/90*
U.S. Cl. 29—580 **10 Claims**



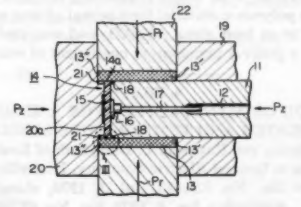
1. A method of forming a connection network for an integrated circuit device, including the steps of providing a substrate of crystalline material having a planar surface, forming in the substrate a first array of grooves of a first depth relative to the planar surface, forming in the substrate a second array of grooves of a second depth relative to the planar surface and such that the grooves of the arrays intersect, and providing conductive strips in the grooves of each said array together with additional conductive strips for selectively electrically interconnecting said conductive strips so that the latter are interconnected according to a desired pattern of interconnections.

4,286,375

METHOD OF MANUFACTURING CORELESS ARMATURE

Yoshimitsu Nakamura, Settsu, and Masami Otada, Shijonawate, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Oct. 1, 1979, Ser. No. 80,678
Claims priority, application Japan, Sep. 29, 1978, 53-120850
Int. Cl.³ H02K *15/02*
U.S. Cl. 29—597 **5 Claims**



1. A method of manufacturing a coreless armature comprising, coupling a cylindrically wound coil having at one of axial end edges a plurality of exposed conductor parts of insulation-coated coil winding wire with an insulative disk member substantially of the same diameter as the inner peripheral diameter of said coil and carrying on one surface a plurality of commutator segments radially extending from the central area to the periphery of said disk member and on the other surface a rotary shaft as secured at one end thereof to the axial center of said disk member while electrically connecting respective said exposed conductor parts to each of said commutator segments,

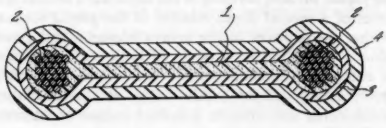
including the steps of inserting said disk member inside said cylindrical coil at a position adjacent said axial end of the coil so as to have respective said commutator segments engaged with each of said exposed conductor parts of the coil, restricting each of said axial end edges of the coil under a pressure applied in axial directions of the coil, defining a ring-shaped space on both of said surfaces of the disk member at the periphery thereof where the disk member abuts the inner periphery of the coil, and applying over the outer periphery of the coil a pressure in all radial inward directions until respective winding turns of the coil partly bulge into said ring-shaped spaces to tightly clamp the peripheral edge of the disk member while other parts of said turns are substantially flatly compressed.

4,286,376

METHOD OF MAKING HEATER CABLE OF SELF-LIMITING CONDUCTIVE EXTRUDATES

Robert Smith-Johannsen, and Jack M. Walker, both of Portola Valley, Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 542,592, Jan. 20, 1975, abandoned, which is a division of Ser. No. 287,444, Sep. 8, 1972, Pat. No. 3,861,029. This application Jan. 11, 1978, Ser. No. 868,517
The portion of the term of this patent subsequent to Jan. 21, 1992, has been disclaimed.
Int. Cl.³ H05B *03/10*
U.S. Cl. 29—611 **7 Claims**



1. A method of forming an electrically conductive self-regulating article which comprises the steps of (1) extruding onto a pair of elongate parallel electrodes held in spaced-apart relation an electrode-interconnecting web of a composition consisting essentially of (a) a thermoplastic crystalline polymeric material exhibiting overall at least about 20% crystallinity as determined by x-ray diffraction and (b) conductive carbon black, the percentage by weight (L) of carbon black based on the total weight of said composition being not greater than about 15, the resulting extrudate exhibiting room-temperature resistivity (R, ohm-cm) greater than about 10^7, and (2) annealing the extrudate at or above the melting temperature of said crystalline polymeric material for a period of time sufficient to reduce R to at least about 100,000, said annealed extrudate exhibiting a positive temperature coefficient of resistance.

4,286,377

METHOD OF MANUFACTURE FOR A RESISTANCE HEATER AND TEMPERATURE SENSOR

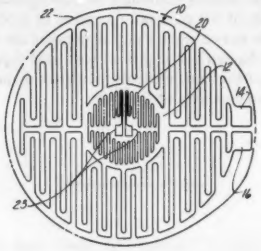
Bohdan Hurko, and Raymond L. Dills, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Division of Ser. No. 921,418, Jul. 3, 1978, abandoned. This application Jun. 4, 1979, Ser. No. 45,358
U.S. Cl. 29—612 **3 Claims**

1. A method of manufacturing a heater including a temperature sensor means, comprising the steps of:

forming a serpentine shaped heater element pattern in a first thin sheet of resistive material, said pattern defining a first electrical current flow path;

forming a serpentine shaped temperature sensor pattern in a second thin sheet of a material different from said first sheet and having a relatively high coefficient of resistivity, said second sheet substantially circumscribed by said first sheet and said sensor pattern being electrically insulated from said heater element pattern and having portions of a much thinner width than said heater element pattern portions, said temperature sensor pattern defining a second electrical current flow path independent of said first



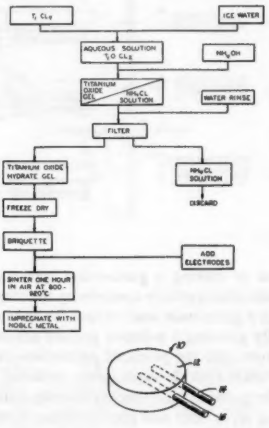
path, said steps being performed simultaneously by photoetching said patterns out of said sheets.

4,286,378

PROCESS FOR PRODUCING A BODY OF SINTERED TiO_2 FOR RESISTIVE GAS SENSOR

Adolph L. Micheli, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 19,276, Mar. 9, 1979, abandoned. This application May 28, 1980, Ser. No. 153,930
Int. Cl.³ H01C *17/28;* C01G *23/047*
U.S. Cl. 29—621 **3 Claims**



1. In a method of making a body of sintered titanium dioxide for a resistive-type exhaust gas oxygen sensor, the improvement comprising:

precipitating a titanium oxide gel by alkalinizing an aqueous titanium choloride solution;

mechanically separating the gel from its solution to provide a titanium oxide hydrate residue which retains microstructure attributes imparted by the gel;

freeze drying the residue to produce unagglomerated minute, highly irregular and interlockable flake-like particles of anatase titanium dioxide;

forming the particles into a low density, porous body having a high surface area; and

sintering the particles under conditions sufficient to strongly bond the particles together but insufficient to reduce said high surface area significantly below about 3 square meters per gram, whereby said body has a high strength and

permits said sensor to be operated at lower temperatures without compensation.

3. In a method of making a body of sintered titanium dioxide for a resistive-type exhaust gas oxygen sensor operating at lower temperatures without recalibration, the improvement comprising:

precipitating a titanium oxide gel and forming NH_4Cl in solution by adding NH_4OH to an aqueous titanium tetrachloride solution;

filtering the gel from said NH_4Cl solution to provide a titanium oxide hydrate residue;

rinsing the residue substantially free of NH_4Cl only with solvents that do not alter the flake-like crystal-forming characteristics of the residue;

applying liquid nitrogen to the residue to quickly freeze it;

freeze drying the residue to produce unagglomerated minute highly irregular flake-like particles of anatase titanium dioxide;

pressing such unagglomerated flake-like particles, without significant prior grinding, into a low density porous body having a high surface area;

providing electrodes for said body to measure electrical resistance change in said body in response to atmosphere change; and

sintering the body in an oxidizing atmosphere for a time and at a temperature generally equivalent to about one hour at 800°–920° C. to provide a body of high mechanical strength without decreasing said high surface area significantly below about 3 square meters per gram.

4,286,379

APPARATUS FOR DETECTING LEADS

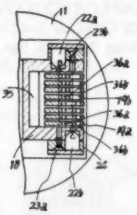
Hidetoshi Kawa, Ibaraki; Kazuhiro Mori, Katano; Kazuo Watanabe, Hirakata, and Yoshihiko Misawa, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 17, 1979, Ser. No. 76,431

Claims priority, application Japan, Sep. 20, 1978, 53-116434

Int. Cl.³ H05K *3/32*

U.S. Cl. 29—705 **6 Claims**



1. An apparatus for detecting leads comprising:

a pair of lever main bodies movable toward or away from each other, each at least at its one end,

a plurality of levers corresponding to the leads and pivotably supported on each of the main bodies by a pin intersecting the plane of movement of the end of the lever main body,

an elastic member provided between each of the lever main bodies and the levers mounted thereon and biasing one end of each of the levers toward one end of the corresponding lever on the other lever main body to bring the lever into contact with a first stopper, the elastic member being elastically deflectable by a force smaller than the force required to clinch the lead,

a second stopper for restraining each of the levers from turning relative to the lever main body more than a specified amount in a direction opposite to the direction in which the lever is biased by the elastic member, and

a detector including photoelectric means mounted on the lever main body for detecting whether or not the lever is in contact with the second stopper.

4,286,380

MANIPULATOR MECHANISMS

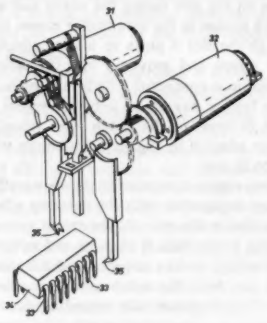
Eric A. Blount, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Apr. 15, 1980, Ser. No. 140,490

Claims priority, application United Kingdom, May 22, 1979, 17793/79

Int. Cl.³ B66C *1/42*; H05K *13/04*

U.S. Cl. 29—741 **8 Claims**



1. A manipulator mechanism including a plurality of pairs of fingers, both fingers of a given pair being capable of movement towards each other in a single plane relative to each other about a datum line lying in said plane, said single planes for all pairs of fingers being parallel to each other and the datum line of all pairs lying in the same plane which is perpendicular to said single planes, each pair of fingers being movable independently of at least some other pairs of fingers; and wherein said movement is produced by means of a pair of engaging wheels one of which drives the other so that rotation of one wheel in one direction produces an opposite rotation of the other wheel, with at least one finger being moved by the action of each wheel; and means for moving fingers of selected pairs towards each other under action of a common drive means.

4,286,381

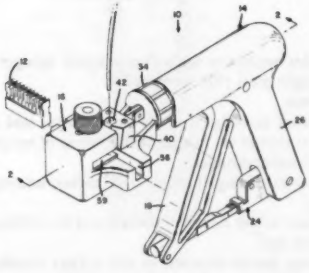
TERMINATING TOOL

Melvin P. Litchizer, Jr., Millersburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 21, 1979, Ser. No. 106,306

Int. Cl.³ H01R *43/04*

U.S. Cl. 29—751 **6 Claims**



1. A hand tool for crimping wires into a connector of the type having a row of cavities on each side and with terminals

of the type having wire-receiving slotted blades being positioned in the cavities, said tool comprising:

a. a piston-shaped handle having a movable shaft and means for moving the shaft back and forth;

b. wire stuffer means attached to the forward end of the shaft for stuffing wires into the wire-receiving slotted blades in the terminals;

c. a work frame attached to the front end of the handle and having a transversely-extending, connector-receiving notch, a block positioned immediately behind the notch and having a longitudinally extending slot through which the wire stuffer means moves and also having wire guide means on the side facing the notch and which intersects the slot so that as the wire stuffer means moves forwardly through the slot it picks up a wire which may be in the guide means and moves it into the slotted blades in a terminal in a connector which may be in the notch, said frame further having an indexing wheel rotatably positioned in front of the notch, said wheel having means thereon adapted to engage a connector which may be in the notch; and

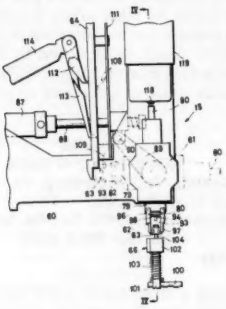
d. indexing means connected to the wire stuffer means at one end and engageable with the indexing wheel at the other end so that as the wire stuffer means moves, it moves the indexing means which engages and rotates the indexing wheel which in turn engages and advances a connector which may be in the notch so as to position a terminal in front of the longitudinally extending slot.

4,286,382

SLIDER APPLICATOR FOR SLIDE FASTENERS

Minoru Ueda, Kurobe, Japan, assignor to Yoshida Kogyo, K.K., Japan

Filed Dec. 26, 1979, Ser. No. 107,382
Claims priority, application Japan, Dec. 29, 1978, 53-162848
Int. Cl.³ B23P *19/00*; A41H *37/06*
U.S. Cl. 29—768 **17 Claims**



1. A slider applicator for a slide fastener stringer traveling along a longitudinal path, comprising:

(a) a frame;

(b) a rocker housing pivotally mounted on said frame for angular movement in a plane transverse of the path of the slide fastener stringer;

(c) a rod extending through said rocker housing in said plane;

(d) a slider holder mounted on said rod for holding a slider thereon; and

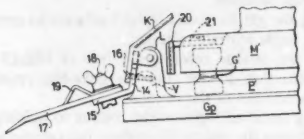
(e) gearing means disposed in said rocker housing for enabling said slider holder to be turned about the axis of said rod so as to orient the slider with respect to the path of the stringer upon the angular movement of said rocker housing.

4,286,383

APPARATUS WITH MOTOR-DRIVEN PEELING DEVICE

Arne S. B. Farden, Harjagersgatan 7, 245 00 Staffanstorp, Sweden

Filed Apr. 25, 1978, Ser. No. 899,812
Claims priority, application Sweden, Apr. 25, 1977, 7704725
Int. Cl.³ A47L *11/12*
U.S. Cl. 30—169 **5 Claims**



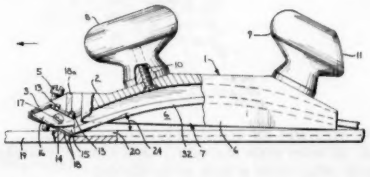
4. A portable peeling apparatus comprising: a portable motor-driven unit and a peeling device with a plate-shaped cutting tool blade having a cutting edge for peeling off remainders of materials on flat surfaces, such as floors, walls and the like, mounted on the motor-driven unit, said motor-driven unit being provided with an oscillatory drive means to which said peeling device with said blade is rigidly connected so that said peeling device, during operation of the unit, performs an oscillatory movement in the plane of the cutting blade so that the cutting edge of the cutting blade undergoes a circulatory cutting movement which is substantially reciprocatory in the longitudinal direction of the cutting edge; rubber dampers mounting said motor unit to said oscillatory drive means which supports said cutting tool blade; an abutment angle being fastened on a portion of the motor unit closely adjacent the cutting tool blade for limiting movement of said oscillatory drive means and hence limiting torsional stresses in the rubber dampers due to movement of the blade.

4,286,384

PANELING CUTTER TOOL

Alan W. Kotchy, 628 Garrison Ave., Nekoosa, Wis. 54457

Filed May 21, 1979, Ser. No. 41,252
Int. Cl.³ B26B *29/00*
U.S. Cl. 30—287 **6 Claims**



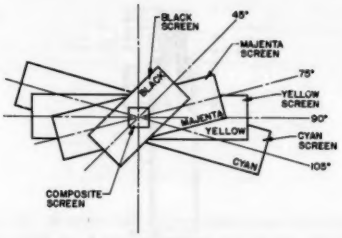
1. A cutting tool for cutting an opening in sheet paneling after the paneling has been secured in place, which comprises a frame having a curvilinear top portion terminating at the forward end of the tool in a downwardly tapered surface having downwardly tapered sides, cutting blades secured to the opposite tapered sides and terminating in sharp overlapping edges, and which face in the direction in which the tool moves and which project in a direction facing the rear of the tool, and laterally spaced side members extending downwardly from the top portion of the tool and disposed to engage the surface of the paneling upon which the tool is used and providing a central channel in the bottom of the frame through which a strip cut from the paneling to form a groove can move for discharge from the rear end of the tool.

4,286,385

COLOR SCREEN INDICATOR

Joseph F. Huck, 904 English St., Irving, Tex. 75061

Filed Dec. 26, 1979, Ser. No. 107,445
Int. Cl.³ G02B *27/0*
U.S. Cl. 33—1 N **9 Claims**



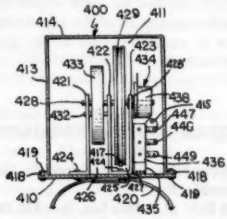
1. An angle indicator for use with overlaying ones of offset color printing screens comprising a unitary composite screen film having a plurality of superimposed rectilinear dot patterns, each arranged as a rectangular array of rows and columns of dots and each defined by a respective one of multiple exposed dot pattern images on said unitary screen film, with each said dot pattern associated with an individual different one of plural process colors, said dot pattern exposed images being respectively relatively angularly oriented, one to the other, each of said dot patterns being formed with predetermined portions thereof within which the dot rows are shifted midway between dot rows of the remainder of that pattern and the dot columns are shifted midway between dot columns of the remainder of that pattern, and with said predetermined portions of each of said dot patterns being respectively distinctively different.

4,286,386

ELECTRO-MECHANICAL DISPLACEMENT MEASURING DEVICE

Irvin E. Long, R.R. 1 Box 175, Wheatfield, Ind. 46392

Continuation-in-part of Ser. No. 830,701, Sep. 6, 1977, abandoned. This application Aug. 28, 1979, Ser. No. 70,485
Int. Cl.³ G01B *7/02*
U.S. Cl. 33—138 **5 Claims**



1. An electro-mechanical displacement measuring assembly for an apparatus having a fixed mechanical member and an elongated mechanical member movable in opposite directions, said assembly comprising a housing provided with a pair of openings and a base, means attached to said base whereby to facilitate connection of said housing to such a fixed member, support means disposed within the confines of said housing and carried by said base and being constructed to provide a pair of spaced formations, a rotatable shaft mounted on said support means and extending transversely into said formations, variable resistance means mounted on said support means and having a portion for varying the effective resistance of said variable resistance means, a pulley disposed in one of said formations and fixedly secured to said shaft for rotation therewith, a flexible element extending through one of said openings having an inner end connected to said pulley and an outer end for connection with such a movable member, means rotatable with said shaft for operating said variable resistance means in response to the movement of such a movable member, a helical spring disposed in the other of said formations having an inner end fixedly secured to said shaft and an outer end connected to said support means for atuomatically causing said flexible element to wrap itself about said pulley after reverse rotation of the latter, an instrument adapted for disposition at a location remote from said housing, and electrical circuitry extending through the outer of said openings in said housing and connecting said variable resistance means and said instrument and for connection with a source of electricity whereby said instrument will provide an indication of the axial displacement of such a movable member.

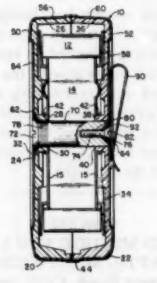
4. An accessory assembly comprising a housing having a base, wall structure secured to said base and provided with a pair of openings, means carried by said housing for fixedly detachably connecting it in relation to a reciprocable member of a power unit, support means disposed within the confines of said housing and affixed to said base, said support means comprising structure providing a pair of formations, bearing means carried by said support means, a shaft rotatable in said bearing means and extending transversely into said formations, a pulley disposed in one of said formations and affixed to said shaft for rotation therewith, a flexible element extending through one of said openings having an inner end attached to said pulley and an outer end for connection to such a reciprocable member, a helical spring disposed in the outer formation and having inner and outer ends respectively fixedly connected to said shaft and to said support means for causing said element to wrap itself about said pulley when such a reciprocable member is operated in one direction and unwrap when operated in an opposite direction, electrical means mounted in said housing and being responsive to the rotation of said pulley, an electrical instrument, and a cable extending through the outer opening in said housing and containing electrical conductors connected to said responsive means and for connection with a source of electricity and to ground whereby said instrument will respond to the operation of said electrical means and indicate the position of said reciprocable member.

4,286,387

COILABLE RULE CASING

Robert Di Diego, Torrance, Calif., assignor to The Stanley Works, New Britain, Conn.

Continuation of Ser. No. 16,925, Mar. 2, 1979, abandoned. This application Apr. 21, 1980, Ser. No. 142,451
Int. Cl.³ G01B *3/10*
U.S. Cl. 33—138 **9 Claims**



1. In a coilable rule having a coilable measuring tape and a coil spring to retract the tape, a casing comprising:

a pair of inner, plastic case members each having a side wall provided with an inwardly extending, peripheral flange

and adapted to fit together to provide a hollow chamber for receiving the measuring tape and coil spring, each inner plastic case member including a central opening in its side wall;

a thin, outer metal case shaped to conform to the exterior configuration of said side walls and flanges of said inner plastic case members and adapted to receive said plastic case members in a close fitting relationship, said outer metal case including a pair of holes formed in its opposite sides in alignment with said openings in said inner plastic case members;

a center post received in said central openings in said plastic case members and extending across the hollow chamber for supporting the measuring tape and coil spring, one end of said post extending through one of said holes in said metal case and having an enlarged head for engaging one side of said metal case adjacent to said one hole to hold said metal case against the adjacent plastic case member and its other end having an inwardly extending axial bore, said post including a knurled surface formed thereon for engaging one of said plastic case members in its central opening to hold said post firmly in place; and

a screw received in said axial bore in said center post and provided with an enlarged headed end for engaging said metal case adjacent to the other hole therein to hold said metal case against the other plastic case member.

4,286,388

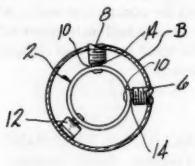
SIGHT WITH REDUCED FRICTION LINE OF SIGHT ADJUSTMENT

Cecil J. Ross, and John F. Thompson, both of El Paso, Tex., assignors to W. R. Weaver Company, El Paso, Tex.

Continuation of Ser. No. 736,661, Oct. 29, 1976, abandoned. This application Dec. 20, 1977, Ser. No. 862,463

Int. Cl.³ F41G *1/38;* G02B *27/32*

U.S. Cl. 33—246 **2 Claims**



2. In an optical gunsight of the type comprising a barrel; windage and elevation adjustment screws made of a relatively hard metal and threadedly mounted on said barrel, said adjustment screws having inner ends disposed in the interior of said barrel; an erector lens housing disposed for pivotal movement within said barrel, said erector lens housing being biased by spring means disposed within said barrel, the improvement comprising: contact means mounted on said erector lens housing for providing point contact with the inner ends of said adjustment screws and with said spring means, said contact means being made of a material which is at least as hard as the metal from which said adjustment screws are made to minimize wear and increase accuracy and repeatability of the line of sight adjustment of the gunsight.

4,286,389

APPARATUS AND METHOD FOR LYOPHILIZING ASEPTIC SUBSTANCES

Robert W. Ogle, Newport Beach, Calif., assignor to IMS Limited, South El Monte, Calif.

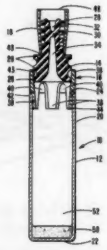
Filed Mar. 3, 1980, Ser. No. 126,198

Int. Cl.³ F27B *5/06*

U.S. Cl. 34—5 **13 Claims**

13. The method of lyophilizing a substance within a container having an open end sealable by an imperforate resilient stopper, which comprises:

frictionally retaining the stopper within a support element mounted to the open end of the container such that the stopper is spaced from the open end and fluid communication with the interior of the container is maintained;



lyophilizing the substance within the container while the stopper is retained within the support element; and

driving the stopper from the support element into the open end to seal the container;

whereby communication with the interior of the container is maintained during lyophilization for escape of the vapor produced, and the container is thereafter sealed.

4,286,390

METHOD FOR REMOVAL OF WATER FROM ACTIVATED CARBON

Ronald J. Convers, Ponca City, Okla., and James A. DeBernardi, Sulphur, La., assignors to Conoco, Inc., Ponca City, Okla.

Filed Mar. 20, 1980, Ser. No. 132,006

Int. Cl.³ F26B *7/00*

U.S. Cl. 34—9 **12 Claims**

1. A method of removing water from activated carbon wherein the method comprises:

(a) passing about 0.2 to about 4 bed weights of liquid 1,2-dichloroethane through a bed of activated carbon, which contains from about 0.1 to about 70 weight percent water, until from about 60 to about 80 weight percent of the water present in the bed has been removed, and

(b) removing substantially all of the remaining water by use of vacuum or by passing hot air or hot nitrogen through the activated carbon.

4,286,391

CONTROL SYSTEM FOR AN AUTOMATIC CLOTHES DRYER

Otto F. Gerry, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Feb. 11, 1980, Ser. No. 120,183

Int. Cl.³ F26B *21/10*

U.S. Cl. 34—44 **4 Claims**

1. A control system for an automatic clothes dryer of the type having a clothes drying drum, an air inlet to the drum, an air outlet from the drum, means for flowing dryer air through the drum and heater means for heating the dryer air at the air inlet side of the drum, the system comprising:

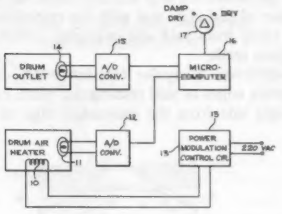
means for sensing the temperature of said dryer air at the inlet side of the drum;

means responsive to the inlet air temperature sensing means for controlling the heater means to maintain the inlet air at a predetermined substantially constant temperature;

means for sensing the temperature of said dryer air at the outlet side of the drum, the outlet temperature having a time-temperture characteristic which is substantially constant over a major portion of the drying cycle at an abso-

lute value dependent on the size of the clothes load and which rises near the end of the drying cycle;

and means responsive to the outlet air temperature for initiating termination of the drying cycle when the sensed



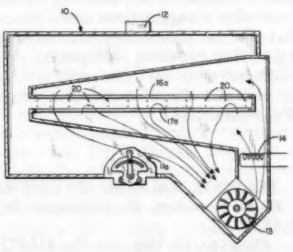
outlet temperature rises above said constant time-temperature value by a predetermined percentage factor, said percentage factor being essentially the same for said dryer irrespective of the absolute value of the sensed constant outlet temperature.

4,286,392

AUTOMATIC LOAD-ADJUSTING VENT CONTROL FOR FILM DRYERS

Michael G. Viland, Bloomington, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Feb. 1, 1980, Ser. No. 117,501
Int. Cl.³ F26B *13/02*
U.S. Cl. 34—47 **4 Claims**



1. A dryer for photographic film sheets having a vent for automatically controlling the intake of outside air, said dryer comprising:

a housing defining a film drying chamber with an outside air intake vent and an air discharge opening and also having film entrance and film exit openings,

means defining a film drying path through said chamber with the entrance at one end and the exit at the other,

means for transporting said sheets of film through said film drying path, from the film entrance opening through the film exit opening,

at least two air-distribution heads respectively disposed on opposite sides of said drying path, each head being a hollow chamber having air discharge openings directing air toward the film drying path,

an air blower located within the housing and provided with an air intake to receive the air discharged from said heads,

the air stream following a first flow pattern directly from both heads to the blower intake when the drying chamber is empty and a second flow pattern around the film sheet when the drying chamber contains a sheet of film to be dried, said second flow pattern producing less static pressure at the air vent than the first flow pattern to increase the intake of outside air only when film to be dried is located in said drying chamber,

said chamber air intake vent being positioned in the portion of the air stream located between the drying path and the blower intake,

passage means for delivering the air discharged from said blower into the air-distribution heads, and

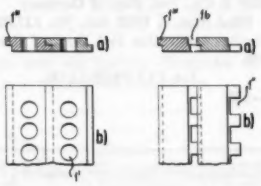
heating means located in the flow path of the drying air.

4,286,393

BOTTOM FOR FLUIDIZED BED

Peter Schulz; Knut Vaupel, both of Essen, and Jürgen Klein, Essen-Überruhr, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Apr. 30, 1979, Ser. No. 34,439
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1979, 2819704
Int. Cl.³ F26B *17/10*
U.S. Cl. 34—57 R **16 Claims**



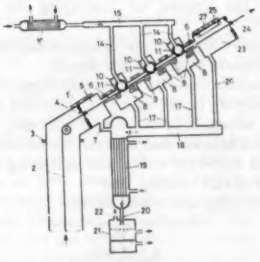
1. A bottom for a fluidized bed, particularly for a fluidized bed conveyor, comprising a plurality of metal members each provided with a plurality of openings for passing a fluidizing gas therethrough and together forming a substantially elongated shape, said members adjoining each other and contacting with each other at contact points which are gas impermeable at least during operation of the fluidized bed, each of said members being elongated and provided with a lateral projection extending in a direction transverse to the direction of elongation, said projections being in contact with each other and said members being movable relative to one another when said projections are in contact with each other.

4,286,394

RECOVERY OF SOLVENT RESIDUES FROM TEXTILES

Meinrad Gort, Goldach, Switzerland, assignor to Rudolf Weber, Rorschach, Switzerland, a part interest

Filed Jan. 2, 1980, Ser. No. 109,157
Int. Cl.³ F26B *13/02*
U.S. Cl. 34—76 **10 Claims**



1. A system for recovering the residues of solvents which remain in textile material during continuous processing of the textile in a processing chamber with a solvent which is organic and immiscible with water, or with a processing medium which contains same, followed by driving off of the solvent from the textile material being processed by means of a gas

which is heated above the boiling temperature of the solvent and condensation of the gas containing the solvent,

said system comprising a chamber arrangement connected in gas-tight manner to the processing chamber and including at least three chambers equipped with transport means for the textile and separated by locks from each other,

at least one of said chambers which is neither the first nor the last chamber traversed by the textile is provided with nozzle means for propelling heated gas through the textile, and

at least the first traversed chamber being provided with means for evacuating said first traversed chamber.

4,286,395

APPARATUS FOR SURFACE TREATMENT OF AN ENDLESS TEXTILE STRUCTURE

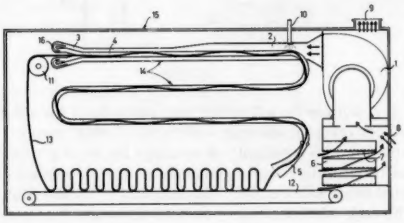
Werner Hoersch, Boisheim, Fed. Rep. of Germany, assignor to Thies GmbH & Co., Fed. Rep. of Germany

Filed Mar. 6, 1980, Ser. No. 127,884

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1979, 2908888

Int. Cl.³ F26B *13/06*

U.S. Cl. 34—155 **11 Claims**



1. An apparatus for the surface treatment of an endless textile structure comprising

a substantially closed container;

means defining an elongated treatment channel within said container for receiving and guiding the textile structure, the interior of said channel constituting a treatment zone substantially isolated from the remainder of the container interior, said channel having an inlet end and an outlet end within said container,

said inlet end and said outlet end being laterally spaced apart;

nozzle means near the inlet end of said channel for directing a stream of air against the textile therein and away from said inlet end to create a current of air longitudinally through the channel for conveying the textile therethrough;

blower means coupled to said nozzle means for supplying air under pressure to said nozzle means;

conveyor means disposed below said channel for receiving and conveying textile emerging from said outlet end to a location substantially below said inlet end;

winch means adjacent said inlet end for receiving said textile from said conveyor means and delivering textile to said inlet end of said channel; and

means for driving said winch means.

4,286,396

TRACTION DEVICE FOR WALKING ON ICE

Robert H. Deacon, 5054 Laurel Ave., Pennsauken, N.J. 08109

Filed Dec. 13, 1979, Ser. No. 103,102

Int. Cl.³ A43C *15/00*; A43B *3/18*

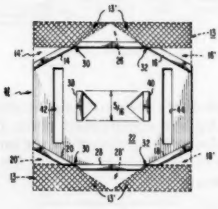
U.S. Cl. 36—62 **3 Claims**

1. A traction device for attachment to shoes to assist in walking on ice, said device comprising:

a metal plate; and means for removably attaching said plate to shoes;

said metal plate being formed as an integral, generally rectangular member and having a generally flat sole-engaging surface, said rectangular plate further having: four triangular portions each bent at one triangle side from a different corner of said plate and with the opposite vertex projecting away from said sole-engaging surface, to form four traction teeth;

two additional triangular traction teeth, one on each of opposite edges of said rectangular plate, each bent at one triangle side from the associated edge of said plate and



with the opposite vertex projecting away from said sole-engaging surface;

said additional teeth being between and spaced from said corner teeth of the associated edge and having respective planes extending transversely to the planes of said corner teeth, said corner and additional teeth being fabricatable together in a single die and stamping operation;

at least one other triangular tooth struck from an intermediate portion of said plate remote from the edges thereof and having a plane extending orthogonally to the planes of said additional teeth and transversely to the planes of said corner teeth and aligned with spaces between said additional and corner teeth.

4,286,397

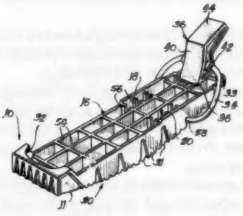
SKI BOOT WALKING ACCESSORY

Donald J. Booty, Frankfort, Ill., assignor to Snow Biz, Inc., Chicago, Ill.

Filed Jan. 17, 1980, Ser. No. 113,072

Int. Cl.³ A43B *5/00*; A43D *5/00*

U.S. Cl. 36—132 **11 Claims**



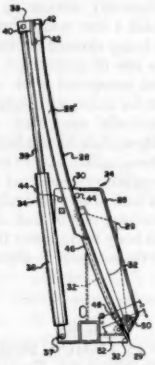
1. Apparatus attachable to an Alpine ski boot for aiding the wearer in walking, said apparatus comprising: auxiliary sole means attachable under the sole of the ski boot and having an upper surface for accommodating the ski boot sole and a lower surface for engaging the ground, means for defining a curvature on the lower surface, rigid pocket means in a leading end portion of said auxiliary sole means for surroundingly engaging a toe portion of the ski boot sole, elastically deformable cord means coupled to said auxiliary sole means and pawl means carried on said elastically deformable cord means for grippingly engaging a heel portion of said ski boot.

4,286,398

APPARATUS FOR EXCAVATING AND TRANSPLANTING TREES AND THE LIKE

Phillip E. Lemond; S. Donald La Shomb, and Oliver R. Rowe, Sr., all of Charlotte, N.C., assignors to Rowe Corporation, Charlotte, N.C.

Filed Sep. 13, 1979, Ser. No. 75,102
Int. Cl.³ A01G *23/04*
U.S. Cl. 37—2 R **13 Claims**



1. An apparatus for excavating and transplanting trees and the like comprising a generally horizontally disposed multi-sided frame defining a substantially enclosed space for overlying and substantially surrounding an area to be excavated, and a plurality of blade assemblies, being mounted on the sides of said frame, each said blade assembly including a housing mounted on said frame, said housing having a downwardly facing opening, a blade disposed in said housing for reciprocation through said downwardly facing opening thereof for penetrating said area to be excavated, operating means associated with said blade for imparting reciprocal movement thereto, and means for guiding and aligning said blade during reciprocation thereof to prevent deviative movement thereof, said guiding and aligning means including a plurality of rollers rotatably mounted in said housing adjacent said downwardly facing opening in rotational engagement with opposite sides of said blade during reciprocation thereof to guide said blade as it penetrates the area to be excavated and to maintain said blade therebetween in a regular and established path of movement while resisting torsional, binding and frictional forces imposed on said blade during penetration of said area to be excavated.

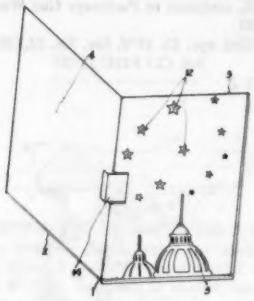
4,286,399

CARD OR BOOK INVOLVING LUMINESCENCE

Masao Funahashi, and Shigeru Maeda, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd. and Kyokuto Electric Co., Ltd., both of Osaka, Japan

Filed Mar. 19, 1980, Ser. No. 131,802
Claims priority, application Japan, Jul. 25, 1979, 54-102784[U]; Jul. 25, 1979, 54-102785[U]
Int. Cl.³ G09F *1/00*
U.S. Cl. 40—124.1 **5 Claims**

1. A card or book involving luminescence and comprising:
at least two openable leaves;
a thin battery provided in one of the leaves and having on one side thereof electrodes to be brought into conduction with each other;
at least one light-emitting diode lit by the battery and having its light-emitting portion exposed to outside on an inner surface of said one leaf;
a switch assembly comprising a slide plate which has one end attached to the inner surface of the other leaf and a free end provided with a conductor piece, the free end being superposed slidably on the electrode bearing side of the battery in said one leaf and the conductor piece being



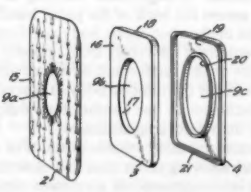
engageable with the battery electrodes in response to opening movement of the two leaves.

4,286,400

PICTURE FRAME AND MANUFACTURE THEREOF

James A. MacPherson, and Joseph Schwartz, both of New York, N.Y., assignors to Avant Modes, Inc., New York, N.Y.

Filed Jul. 31, 1980, Ser. No. 174,013
Int. Cl.³ G09F *1/12*
U.S. Cl. 40—152 **19 Claims**

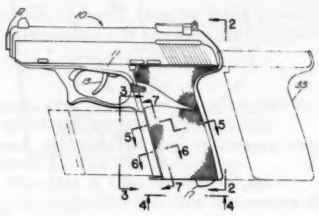


1. A decorative frame assembly for displaying an article, said assembly comprising a front part with a front face having an opening extending therethrough, a back part substantially co-extensive with said front part and having an opening extending therethrough, said last-mentioned opening corresponding in shape to the shape of the opening in the front part but having a size different from the size of the opening in the front part and said back part being mounted adjacent said front part with the opening in the back part aligned with the opening in the front part, said back part having a peripheral shape corresponding to the peripheral shape of said front part but having a size different from the peripheral size of the front part, a sheet of decorative material covering said front face and extending between said front part and said back part both at the peripheries thereof and at the peripheries of the opening therethrough, at least one said part having a rim thereon around the opening therethrough and extending toward the other part and frictionally engaging said sheet material between said rim and the other part and at least one said part having a rim at the periphery thereof and extending toward the other part and frictionally engaging said sheet material between said last-mentioned rim and said last-mentioned other part, whereby said sheet material is clamped between said front part and said back part both at the peripheries of the openings and at the peripheries of the parts and said parts are maintained adjacent to each other, and supporting means secured to one said part for supporting said frame on a support.

4,286,401
CUSHIONED GUN GRIP

Frank A. Pachmayr, Los Angeles, and Jack R. Farrar, Whittier, both of Calif., assignors to Pachmayr Gun Works, Inc., Los Angeles, Calif.

Filed Apr. 23, 1979, Ser. No. 32,170
Int. Cl.³ F41C *23/00*
U.S. Cl. 42—71 P **27 Claims**

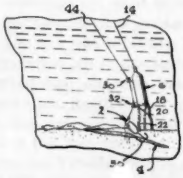


1. A pistol grip comprising:
a cushioning part to be received about a pistol handle and including a body of elastomeric material and a reinforcing structure embedded therein;
said body of elastomeric material forming a rear portion of the body adapted to extend across the back of said pistol handle and forming two side panels of said elastomeric material projecting forwardly from opposite side edges of said rear portion in spaced relation to be received at opposite sides of the pistol handle;
said reinforcing structure being of generally U-shaped horizontal sectional configuration forming a rear portion extending across the back of the pistol handle within said rear portion of the elastomeric body and forming two side portions projecting forwardly from opposite edges of said rear portion of the reinforcing structure and within said side panels of the elastomeric body in spaced relation and free of attachment to one another forwardly of said rear portion of the reinforcing structure;
said rear portion and said two side portions of said reinforcing structure all being stiffer than said elastomeric material and being interconnected in a relation maintaining said reinforcing structure by its stiffness in said U-shaped horizontal sectional configuration.

4,286,402
FISHING LURE RETRIEVER

J. Bruce Kuhn, 4931 Coldwater Canyon, Apt. 12, Sherman Oaks, Calif. 91423; Klaus P. Utecht, 833 Lamplight Dr., La Jolla, Calif. 92037, and Ronald K. Harris, 11480 Amanda Dr., Studio City, Calif. 91604

Filed Jul. 13, 1979, Ser. No. 57,337
Int. Cl.³ A01K *97/00*
U.S. Cl. 43—17.2 **2 Claims**

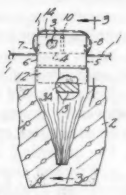


1. A fishing lure retriever comprising:
an elongate body having a fully enclosed interior cavity extending for the length of said body, said body having a leading end and a trailing end, said leading end and said trailing end of said body having a conical shape, the apexes of said conically-shaped ends being directed in opposite directions away from said body;
a plurality of chain members attached at one end thereof to said leading end of said body;
aperture means for permitting a guy line to be attached to said trailing end of said body, said aperture means formed on the trailing end of said body;
a plurality of pellets contained in and partially filling said interior cavity;
guide means for physically associating said body with a fishing line to which a lure being retrieved is connected, said guide means being situated on said body, said guide means including a pair of guides each including a pair of oppositely-directed juxtaposed hook members which are separated by a slot for receiving a fishing line with which said body is physically associated, said guides being aligned along a side surface of said body along a line that is parallel to the longitudinal axis of said body; and
a plurality of ledge members connected to said leading end of said body at the base of said conically-shaped end, each ledge member receiving one of said chain members, said leading end of said body being lower than the trailing end of said body when the retriever is submerged in the course of operation.

4,286,403
ONE WAY FISHING SINKER

Stanley L. Rogers, 3950 Dillard Rd., Eugene, Oreg. 97405

Filed Apr. 25, 1980, Ser. No. 144,164
Int. Cl.³ A01K *95/00*
U.S. Cl. 43—43.12 **18 Claims**



1. A one way disposable sinker for attachment to a fishing line segment, said sinker comprising,
a weight member,
a water soluble assembly including a water soluble member including means for line attachment, an extension in place on said member and at least partially embedded within said weight member, said soluble member dissolvable upon immersion to release the weight member from the line.

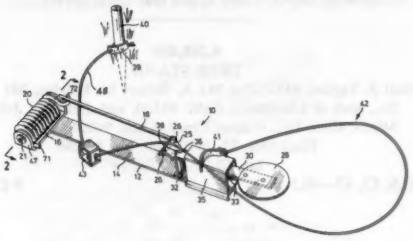
4,286,404
TRAP CONSTRUCTION

Milan Novak, Aurora, and William F. Adams, Barrie, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of Natural Resources, Toronto, Canada

Filed Feb. 5, 1980, Ser. No. 118,843
Claims priority, application Canada, Jan. 11, 1980, 343541
Int. Cl.³ A01M *23/34*
U.S. Cl. 43—87 **6 Claims**

1. In an animal trap having a frame and an arm which is adapted to swivel about an axis normal to its longitudinal extent under the urging of a coil spring encircling an axis member joined to the arm and disposed substantially at right angles thereto to define the said axis, the axis member extending through a first bracket member fixed to the frame and toward a second bracket member fixed to the frame, the improvement comprising:
two bushings, one bushing receiving the end of said axis

member which is remote from the joined location, said one bushing being configured as a cylinder whose outer diameter is at least 75% of the inner diameter of the spring, the cylinder being received within one end of the coil spring and having a coaxial cylindrical extension at one end which is received within an aperture in said second bracket, the other bushing having a cylindrical body whose outer diameter is at least 75% of the inner diameter



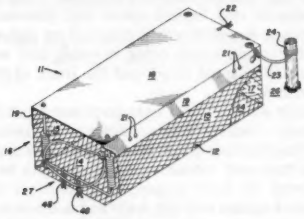
of the spring, said cylindrical body being received within the other end of the coil spring, a flange extending radially outwardly from one end of the cylindrical body, the flange being interposed between said coil spring and said first bracket, said other bushing having a central bore receiving said axis member, and means smaller in diameter than said cylindrical body spacing the cylindrical body from said first bracket.

4,286,405

TRAP FOR PIT VIPER

Walter E. Howard, 24 College Park, Davis, Calif. 95616

Filed Apr. 14, 1980, Ser. No. 140,155
Int. Cl.³ A01M *23/34*
U.S. Cl. 43—87 **6 Claims**



1. Trap for pit viper comprising:

a. an elongated cage including at least a top and a pair of side walls, said cage being open at one end to provide ingress for the head of a pit viper and closed at the other end to prevent egress therefrom; and,

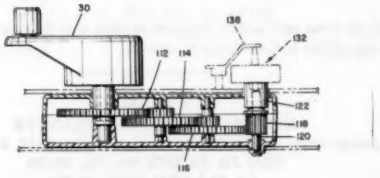
b. noose means located at said one end of said cage for constricting the neck of a pit viper at the junction of the neck and the head following the insertion of the head through said noose means and engagement between the base of the head and the forward side of said noose means as withdrawal of the head is attempted, said noose means including a first wire and a second wire, each having a loop at one end and a bail extending to the other end, said loop of said first wire being slidably disposed on said bail of said second wire and being movable between a first location adjacent said other end of said second wire to a second location removed therefrom, said loop of said second wire being slidably disposed on said bail of said first wire and being movable between a first position adjacent said other end of said first wire and a second position removed therefrom.

4,286,406

SPINNING TOP PINBALL-TYPE GAME

Larry A. Sims, Hermosa Beach; Gerald L. Lambert, Torrance; Raymond J. Gross, Culver City, and Harold B. Collins, Santa Monica, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Division of Ser. No. 965,972, Dec. 4, 1978, Pat. No. 4,248,426.
This application May 19, 1980, Ser. No. 150,880
Int. Cl.³ A63H *1/02*
U.S. Cl. 46—72 **7 Claims**



1. In a toy, the combination comprising:

a top having an enlarged body portion, and a stub base portion with an irregular configuration about the periphery thereof; and

top spinning means including a supporting structure, a shaft mounted within said supporting structure and having axially movable thereon a sleeve member having an aperture keyed for receiving the irregular base portion of said top, means for rotating said sleeve, and release lever means manually operable for sliding said sleeve out of engagement with the base portion of said top, said release lever means having an arm member configured for contacting the body of said top upon movement of said sleeve member for directing the top onto a playing surface.

4,286,407

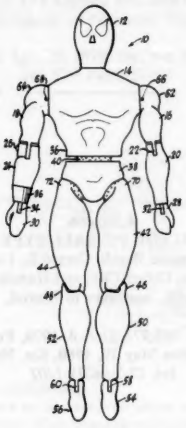
DOLL FOR CONTAINING FILAMENT PRODUCING FLUID

Cecil F. Adickes, Jr., Playa del Rey, Calif., and David R. Berko, Flushing, N.Y., assignors to Mego Corp., New York, N.Y.

Filed Mar. 17, 1980, Ser. No. 131,119
Int. Cl.³ A63H *3/00*
U.S. Cl. 46—163 **9 Claims**

1. In a doll having a plurality of limbs, the improvement comprising an adjustable limb having a hollow forearm section threaded for attachment, a wrist section adapted to connect

with the threaded section, the wrist section having an aperture therethrough therein through which a filament-producing



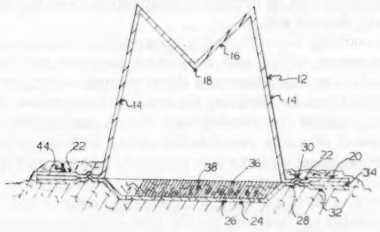
fluid from said hollow forearm section may pass upon activation of the hollow forearm section.

4,286,408

SELF-WATERING SEED PLANTER

Joseph Manno, 2329 Rue de Anne, La Jolla, Calif. 92037

Filed Jul. 20, 1979, Ser. No. 59,226
Int. Cl.³ A01G *27/00, 13/04*
U.S. Cl. 47—27 **3 Claims**



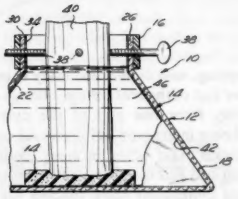
1. A self-watering, weed retarding solar planter, comprising:
(a) a self-supporting elongated hood having similar opposed upstanding sides with co-planar lower edges and a top joining said sides, said top having a re-entrant portion converging downwardly between the sides and defining a drip edge above the level of said co-planar lower edges;
(b) said sides and top including said drip edge being imperforate;
(c) said sides being translucent and having bilaterally outwardly extending horizontal aprons at said level, said aprons being functional as ground covers and as anchors for the planter when soil is mounded upon said aprons;
(d) an open topped seed pan secured to and between said co-planar lower edges and longitudinally coextensive with said hood, with a complement of seeds and mulch in said seed pan;
(e) said seed pan having a perforate bottom whereby, in use, soil moisture may initially enter the hood through said perforate bottom and with said translucent sides create miniature hothouse conditions within the hood and seed pan, while moisture condensing on said re-entrant portion is concentrated to fall onto a small area of the seed pan beneath said drip edge;
(f) said bottom of the seed pan being soluble so that the seed pan disintegrates allowing root growth and eventual removal of the hood without damage to the plant roots; and
(g) said aprons each comprising an upper layer and a lower layer, said upper layer being unitary with said hood and said lower layer being unitary with the seed pan and likewise soluble, and said aprons having weed retardant material between said upper and lower layers.

4,286,409

TREE STAND

Neil J. Taylor, 5492 Cleo St.; A. Robert St. Hilaire, 331 Pearl Dr., both of Livermore, Calif. 94550, and James L. Johnson, 340 N. Civic Dr., Walnut Creek, Calif. 94956

Filed Oct. 22, 1979, Ser. No. 87,260
Int. Cl.³ A47G *33/12*
U.S. Cl. 47—40.5 **8 Claims**



1. A tree stand comprising:
a sheet material housing having a planar base and a plurality of spaced-apart side wall members attached to said base and extending therefrom, each said side wall member including an outermost member, said outermost members to be locatable to form an enclosing area spaced above said base and centrally disposed in relation thereto;
an interior chamber bounded by the inner surface of each of said side wall members and the upper surface of said base, a support ring located about said outermost members, securing means movably mounted on said support ring, said securing means being movable into said enclosing area and adapted to contact the trunk of the supported tree; and
a flexible walled, water tight container located within said interior chamber, said container to be positioned against the inner surface of said side walls and the upper surface of said base, said container being adapted to be filled with a quantity of water causing said container to be tightly pressed against said side walls and said base to make available moisture to the truck of the supported tree and also provide sufficient weight at the base of the tree to keep the tree from tipping.

4,286,410

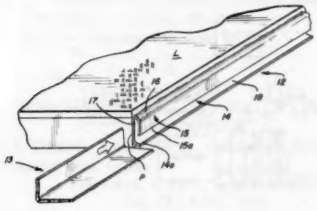
ASSEMBLY FOR WEATHER-SEALING A JOINT

Norbert Hahn, Cudahy, Wis., assignor to Rite-Hite Corporation, Milwaukee, Wis.

Filed Dec. 10, 1979, Ser. No. 101,779
Int. Cl.³ E06B *7/00*
U.S. Cl. 49—33 **7 Claims**

1. An assembly for weather-sealing an elongated joint formed between a first member and a second member when said members assume a predetermined relative position, one of the members being relatively movable in a plane substantially parallel to the joint and transversely of the other member, said assembly comprising an elongated piece having an elongated first section and an elongated resilient flexible second section extending angularly from said first section; and an elongated bracket removably accommodating said piece, said bracket including an elongated inner wall section adapted to be fixedly

secured to a side of one of the members defining the joint, an elongated outer wall section disposed in spaced substantially face-to-face relation with said inner wall section, and an elongated bridge section interconnecting a pair of corresponding first elongated edge portions of said wall sections, said inner and outer wall sections and said bridge section coacting to form an elongated pocket having a first opening at one end, corresponding second elongated edge portions of said wall sections being in spaced relation and forming an elongated narrow second opening, one end of said second opening ter-



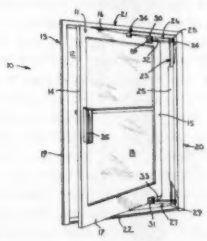
minaing at said first opening; the elongated first section of said elongated piece being disposed within the pocket of said bracket and the elongated second section of said elongated piece extending outwardly from said pocket through said second opening, said piece second section being adapted to span the joint and resiliently and sealingly engage the side of the other member defining the joint when the members assume the predetermined position, said piece first section being inserted into and removed from said pocket only through said first opening.

4,286,411

MANUAL BALANCED DOOR WITH DOOR CLOSER ARM

Lee Wikkerink, Greendale, and James R. Schinschke, Milwaukee, both of Wis., assignors to Wikk Industries, Inc., Greendale, Wis.

Filed Sep. 6, 1979, Ser. No. 73,019
Int. Cl.³ E05D *15/30*
U.S. Cl. 49—252 **11 Claims**



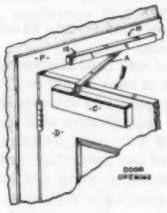
1. A balanced door assembly comprising:
a door frame having a base, a hinge side jamb, a latching side jamb, and a header that define a doorway, the header including a chamber and a guideway which extend transversely above the doorway and which are separated by a transversely extending rib formed by the header, the guideway opening downwardly towards the doorway;
a hinge shaft disposed within the hinge side jamb;
a door with an upper leaf in which a guideway is formed to open upwardly towards the header;
an upper and a lower door pivot arm each having a hinge end pivotably mounted to the hinge shaft and each having a traveling end on which the door is pivotably mounted, the traveling ends being vertically aligned to define a first axis of a door rotation;
a door closer disposed within the header chamber and having an pivotable shaft extending downwardly from the header;
a closer arm having a pivot end mounted on the closer shaft and having a traveling end that swings around its pivot end;
a guide roller mounted to the upper leaf of the door and projecting into the guideway in the header to provide a second axis of door rotation, the second axis being retained within the door frame as the door is pivotably opened and closed;
pivot means mounted on the traveling end of the closer arm and received in the door guideway for providing a third axis of door rotation; and
wherein, the first and third axes of door rotation are displaced from the doorway in opposite directions as the door is opened.

4,286,412

HOLD-OPEN DEVICE FOR USE WITH CONVENTIONAL DOOR CLOSER

William E. Stevens, Monroe, N.C., assignor to Scovill Inc., Waterbury, Conn.

Filed Jul. 25, 1979, Ser. No. 60,825
Int. Cl.³ E05F *1/00;* **E05C** *17/04*
U.S. Cl. 49—379 **7 Claims**



1. A selectively operable hold-open device for use with a conventional single-arm door closer, mounted on a swinging door comprising:
(a) track means;
(b) shoe means adapted to be connected to the distal end of the door closer arm and to move along the track means, the shoe means having a latch-receiving recess;
(c) a movable frame pivotally mounted adjacent the track means;
(d) a latch pivotally secured to the frame and pivoting about a fixed pivot point on the frame;
(e) power means disposed adjacent the track and adapted to selectively assume a first position to hold the frame with the latch in the path of the shoe in latch position so that when the recess on the shoe passes the latch as the door approaches open condition, the shoe can not pass back the other way without the latch engaging the recess and holding the shoe unless the power means moves or is moved out of the first position.

4,286,413

HOLE GRINDING MACHINE

Holger Axelsson, Bromma, and Lars Siggelin, Tumba, both of Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Jan. 16, 1980, Ser. No. 112,385
Int. Cl.³ B24B *7/10*
U.S. Cl. 51—3 **10 Claims**

1. An improved indexing head apparatus for use in grinding machines of the type including a frame, a first grinding means mounted on said frame for internal grinding of an axially ex-

tending hole in a workpiece and a second grinding means mounted on said frame for grinding internal seats or deadend holes, said apparatus comprising:

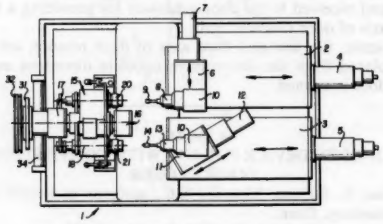
a shaft;

means adapted to be mounted on the frame for supporting said shaft for rotation;

a head element mounted on said shaft for rotation therewith;

a pair of chuck spindles mounted for rotation on said head element, said spindles each having a chuck for holding a workpiece in position to be ground by said grinding means;

means for reciprocating said head element and said shaft between two end positions located one half turn from each



other whereby each chuck spindle with its associated chuck and workpiece is alternatingly positioned for grinding the workpiece first by the one and then by the other of said grinding means;

a pair of stop means fixed relative to said frame for defining said end positions;

means mounted on said head element for contacting one of said stop means at each of said end positions;

means for disengaging said reciprocating means prior to contact of said head element with said stop means; and

means cooperating with said contacting means for completing movement of said contacting means into contact with said stop means and holding said head element in such position while grinding is in process.

4,286,414

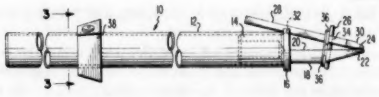
WORK HOLDER

Douglas H. Ziegel, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 4, 1980, Ser. No. 118,214

Int. Cl.³ B24B *19/16*

U.S. Cl. 51—229 **8 Claims**



1. A work holder, comprising:

a handle;

a fixed jaw secured to one end of the handle and projecting therefrom, the fixed jaw having a flat surface extending longitudinally from the end of the handle and the fixed jaw being tapered at one end to provide a pointed tip;

a movable jaw pivotally mounted over the fixed jaw and having a pointed tip at one end which contacts the pointed tip of the fixed jaw, the movable jaw being at an angle with respect to the fixed jaw;

a pin extending through both of said jaws, the pin being fixedly secured to the fixed jaw and the movable jaw being movable along said pin; and

means normally holding said tips of said jaws together while permitting movement of the movable jaw to separate said tips of said jaws to permit a workpiece to be inserted between said tips of said jaws and to permit a workpiece to be removed from between said tips of said jaws.

4,286,415

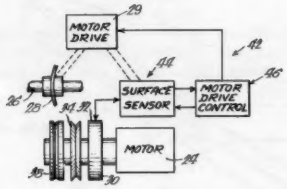
METHOD OF EDGING LENSES

Wilfredo P. Loreto, Hoffman Estates, Ill., assignor to AIT Industries, Inc., Schaumburg, Ill.

Division of Ser. No. 19,767, Mar. 12, 1979, Pat. No. 4,233,784. This application Apr. 28, 1980, Ser. No. 144,067

Int. Cl.³ B24B *1/00*

U.S. Cl. 51—284 E **13 Claims**



1. In a method of grinding an article with a grinder having a grinding surface and an axis of rotation, comprising the steps of detecting the height of discrete axial positions on the grinding surface between opposite sides thereof and generating signals having values representative thereof; comparing the values of said signals and generating an indication of the grinding surface axial position whereat said signals represent greatest height; and moving the article in accordance with said indication against the axial position of greatest height.

4,286,416

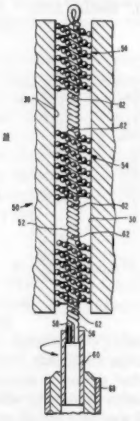
SEGMENTED FLEXIBLE HONE

Frank W. Cooper, Jr., Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 1, 1978, Ser. No. 930,076

Int. Cl.² B24B *33/02*

U.S. Cl. 51—334 **10 Claims**



1. A segmented flexible hone comprising:

a high pressure helically wound tubular member having holes disposed therein and capable of being disposed in a tubular hole;

a plurality of outwardly extending flexible spirally wound nylon bristles having abrasive globules attached to the outer ends thereof with the inner ends being attached to

said tubular member at segments along said tubular member; said tubular member having intervals free of said bristles with said holes being located in said tubular member in the intervals wherein said tubular member is free of said bristles;

a high pressure nozzle attached to said tubular member at one end thereof for conducting a lubricant through said tubular member and through said holes in said tubular member at a pressure between about 80 psi and about 2000 psi; and

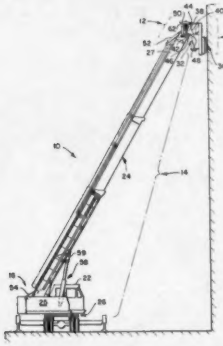
a rotational mechanism attached to said nozzle for rotating said tubular member while said lubricant is being conducted therethrough, thereby causing said globules and said lubricant to contact the inside surface of said tubular hole, thus enlarging said tubular hole.

4,286,417

BLASTING MACHINE WITH POSITION SENSING AND ADJUSTMENT

John J. Shelton, Tuttle, Okla., assignor to Robert T. Nelson, Oklahoma City, Okla.

Filed Aug. 8, 1979, Ser. No. 64,753
Int. Cl.³ B24C *3/06*
U.S. Cl. 51—415 **24 Claims**



1. Apparatus for treating a surface comprising a land vehicle including a truck, a boom carried by said truck, said boom having an end portion proximal to said truck and a distal end portion remote from said truck, a blasting member positioned on said distal end portion, means to pivot said boom with respect to said truck to raise or lower said blasting member, means to move said boom transversely, said blasting member having an opening for delivery of an abrasive therethrough to contact an adjacent surface to be treated, said blasting member being pivotally mounted on the distal end of said boom for rotation about two axes one substantially perpendicular to another, sensing means for sensing the position of said opening with respect to said surface, and adjusting means operatively associated with said sensing means for maintaining said opening closely adjacent said surface in response to signals from said sensing means indicating a change in position of said opening with respect to said surface.

4,286,418

SPOUTING ICE PROTECTORS

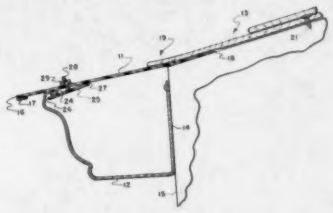
Ralph C. Snyder, 32830 Arlesford Dr., Solon, Ohio 44139

Filed Jun. 25, 1979, Ser. No. 51,446
Int. Cl.³ E04D *13/02, 13/06*
U.S. Cl. 52—11 **8 Claims**

1. A roof-spouting ice protector comprising in combination:

a plastic protector strip having a plurability of openings therein, longitudinally spaced,

a fastener comprising a strip relatively narrow and short in comparison with the said plastic strip, and having a threaded post perpendicularly secured thereto intermediate the length thereof, and adapted to be passed through holes in said plastic strip from below,



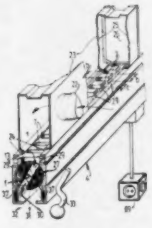
a nut mating the thread of said post adapted to draw said fastener toward said plastic strip for securing the latter against and over spouting.

4,286,419

BUILDING STRUCTURE AND COUPLING PROFILE ASSOCIATED THEREWITH

Willem M. Treffers, No. 34, Jacob van Lenneplaan, Baarn, Netherlands

Continuation of Ser. No. 685,329, May 11, 1976, abandoned.
This application Jan. 9, 1978, Ser. No. 867,944
Claims priority, application Netherlands, May 15, 1975, 7505763
Int. Cl.³ G09F *7/18*
U.S. Cl. 52—39 **7 Claims**

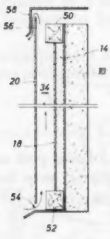


1. In a building structure, a suspended grid system comprising a plurality of elongate, identical coupling profiles, each of substantially channel-shaped section open at the bottom, each coupling profile having a series of spaced openings in its top, an air regulator device freely axially positioned within the length of at least one coupling profile at a desired location and cooperating with the openings at said location to pass conditioned air at said desired location while leaving those openings beyond said location free to pass return air, a conditioned air inlet cabinet mounted on top of said one coupling profile at said desired location, said cabinet being open along its bottom to pass conditioned air through said openings at said desired location to and through said air regulator device, said one coupling profile carrying electric leads adjacent the open bottom thereof, and at least one electrical connection device freely axially positioned along the length of said one coupling profile at a particular location and cooperating with the electrical leads at such particular location to provide electrical outlet connection thereat, the air supply regulator being formed by a roller of sound-insulating material, in which a plurality of air flow channels of circular section is provided, the diameter of said section being so small that the air emerges in the form of a turbulent stream.

4,286,420
HEAT RETENTION WALL SYSTEM

Panayiotis D. Pharmakidis, 7623 Bonniebrook, Sylvania, Ohio 43560

Filed Apr. 18, 1979, Ser. No. 31,074
Int. Cl.³ E04B 1/74
U.S. Cl. 52—404 35 Claims

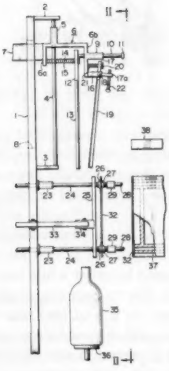


1. A wall, comprising
a vertical interior mass in the range between 20 pounds per square foot and 500 pounds per square foot of wall surface,
an insulation layer positioned opposing the external surface of said interior mass, and
a conductive exterior affixed with respect to said insulation layer so as to have space for air circulation between said conductive exterior and said insulation layer.

4,286,421
METHOD AND MACHINE FOR FITTING A SLEEVE SEAL OF A COLLAPSED FORM OVER A CONTAINER

Masaaki Fujio, Suita, Japan, assignor to Fuji Seal Industry Co., Ltd., Osaka, Japan

Filed Dec. 31, 1979, Ser. No. 108,643
Claims priority, application Japan, Jan. 18, 1979, 54-3363
Int. Cl.³ B65B 13/00, 61/00
U.S. Cl. 53—399 4 Claims

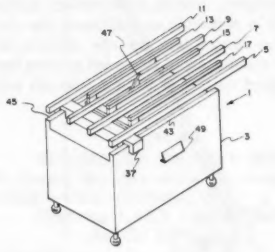


1. A method for fitting a sleeve seal over a container comprising the steps of:
(a) supplying a sleeve seal in a flattened form between opposing suction holding cups, and actuating the suction holding cups to hold the sleeve seal;
(b) moving the suction holding cups apart so as to partly open the sleeve seal;
(c) inserting opening members into the partly opened sleeve seal;
(d) moving the opening members apart to stretch the sleeve seal, in such a manner that in the direction of movement of the opening members the sleeve seal is stretched substantially larger than its final dimension when fitted over the container, and in the direction orthogonal both to the direction of movement of the opening members and to the axis of the sleeve seal it is stretched to substantially less than its final dimension when fitted over the container;
(e) moving the opening members together so that the sleeve seal is relaxed and adopts a shape substantially similar to its required final shape when fitted over the container;
(f) inserting the container into the sleeve seal;
(g) simultaneously holding the sleeve seal in position on the container and extracting the opening members; and
(h) wherein substantially throughout the stretching step (d) the suction holding cups are disengaged from the sleeve seal, and the suction holding cups are reengaged with the sleeve seal during step (e) so as to retain the sleeve seal in position as the container is inserted.

4,286,422
WALKING BEAM BAG LOADER

Milton A. Howe, Jr., Spartanburg, S.C., assignor to W. R. Grace & Co., Cryovac Division, Duncan, S.C.

Continuation of Ser. No. 865,039, Dec. 27, 1977, abandoned.
This application Dec. 26, 1979, Ser. No. 107,485
Int. Cl.³ B65B 5/04, 67/04
U.S. Cl. 53—473 7 Claims



1. An apparatus for conveying articles in a direction of progression, comprising:
a group of beams movable only horizontally;
a group of beams movable only vertically; and
means for providing reciprocating movement to said vertically movable beams and said horizontally movable beams, and wherein said beams are cantilevered in the direction of article progression and are spaced apart at their respective termini so as to permit insertion of a container both between and beneath said beams at the termini thereof,
said means for providing reciprocating movement being a single rotatable cam for having a cam follower for vertically reciprocating said vertically movably beams, said cam having attached thereto a vertical beam for horizontally reciprocating said horizontally movable beams.

4,286,423
CROP CUTTING APPARATUS

Godfrey P. Caldwell, Oxford, and Nigel W. Meek, Aylesbury, both of England, assignors to Agrimech Engineering Ltd., Aylesbury, England

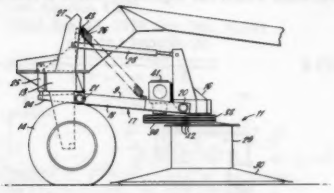
Filed Sep. 4, 1979, Ser. No. 72,247
Claims priority, application United Kingdom, Sep. 4, 1978, 35446/78; Sep. 29, 1978, 38763/78
Int. Cl.³ A01D 35/264
U.S. Cl. 56—6 20 Claims

1. Crop cutting apparatus, comprising:
a main frame;
at least one pair of rotary cutting devices each for cutting

crop by rotary movement of cutting elements of the cutting device about a vertical axis which passes through a ground skid for supporting at least partially the cutting device upon the ground, the vertical axes of the cutting devices being spaced apart transversely relative to the intended direction of forward travel of the apparatus;

each cutting device having a drive device individual thereto spaced from the axis of the cutting device and at least one endless elongate drive member coupling the drive device to the cutting device for driving the cutting device in rotation;

each cutting device having a subframe individual thereto movably mounted upon said main frame so as to allow



substantially vertical movement of each cutting device with its subframe relative to said main frame independent of vertical movement of said other cutting device or devices, the vertical movement allowed being sufficient to enable each cutting device to follow undulating ground; and

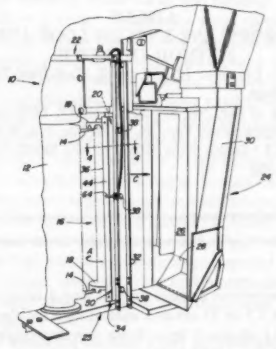
each cutting device being suspended directly from its associated subframe, and each drive device being directly attached to its associated subframe such that each cutting device is mounted together with its associated drive device upon said associated subframe for movement of both said cutting device and said drive device with said subframe during said vertical movement.

4,286,424

BLOCKAGE DETECTOR FOR A COTTON HARVESTER

Arthur L. Hubbard, Ankeny, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Apr. 11, 1980, Ser. No. 139,576
Int. Cl.³ A01D *45/18*
U.S. Cl. 56—10.2 **10 Claims**



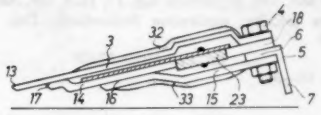
1. In a cotton harvester having a harvesting unit defining an upright discharge opening, a harvesting mechanism carried by the harvesting unit including rotatable doffer means for directing a flow of harvested cotton along a path between the doffer means and the discharge opening, a warning system comprising: a movable flap connected to the harvesting unit adjacent the doffer means and offset from the path, said flap biased toward a first position and shiftable from said first position to a second position by the cotton as the flow deviates from the path and the cotton impinges against the flap; and means responsive to the movement of the flap for providing a signal when the flap is shifted to the second position.

4,286,425

CUTTER FINGER FOR CUTTER BAR MOWERS

Gustav Schumacher, II, Gartenstrasse 8, 5231 Eichelhardt, and Günter Schumacher, Raiffeisenstrasse 10, 5231 Eichelhardt, both of Fed. Rep. of Germany

Filed Dec. 14, 1979, Ser. No. 103,951
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1978, 2855234
Int. Cl.³ A01D *55/10*
U.S. Cl. 56—307 **9 Claims**



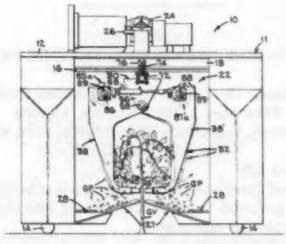
1. In cutter finger apparatus for cutter bar mowers including a lower finger portion fixed to a cutter bar at a rearward end thereof and a separate upper finger portion situated over said lower finger portion and supported by said cutter bar at a rearward end thereof, said upper and lower finger portions defining a slot therebetween adapted to receive a cutter knife therein, said upper and lower finger portions each having forward ends and being fixed to each other at a location forwardly of said knife slit and bolted to each other at a location rearwardly of said knife slit, the improvement comprising: said upper and lower finger portions are each formed by stamped, metallic material; and said upper finger portion includes an end portion projecting in the forward direction beyond said forward end of said lower finger portion so that said forward end of said upper finger portion constitutes a cutter finger tip.

4,286,426

VIBRATORY FRUIT HARVESTER

Franklin P. Orlando, Morgan Hill, and Richard W. Fitzmaurice, Santa Clara, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Nov. 19, 1979, Ser. No. 95,822
Int. Cl.³ A01D *46/26, 46/28*
U.S. Cl. 56—330 **23 Claims**



1. In a harvesting apparatus that includes a vehicle movable to a position adjacent the plant to be harvested, said vehicle including a support frame, a shaker assembly mounted to said vehicle support frame for shaking the trunk of a plant to dislodge crops therefrom comprising: a shaker frame, means connected to said support frame for mounting said shaker

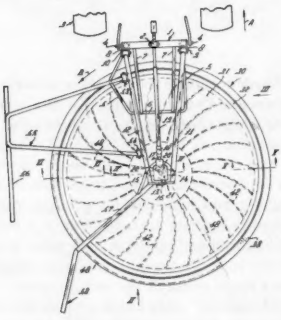
frame for pivoting about a single axis that is overhead the plant to be shaken, said shaker frame including first and second frame sections that extend downwardly of said axis of rotation in substantially fixed relation to each other and that terminate in outer ends, striker members connected to said outer ends in opposing relation, and drive means separate and distinct from said striker members and being connected thereto only through said shaker frame for oscillating said shaker frame as a single unit about said axis to cause said striker members to alternately impact the opposite sides of the trunk of said plant, said drive means being connected to said shaker frame at a height situated generally above said plant.

4,286,427

AGRICULTURAL MACHINE

Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Continuation of Ser. No. 749,172, Dec. 9, 1976, Pat. No. 4,208,863. This application Sep. 17, 1979, Ser. No. 75,986
Claims priority, application Netherlands, Dec. 12, 1975, 7514498
Int. Cl.³ A01D *77/06*
U.S. Cl. 56—377 **6 Claims**



1. A mobile agricultural machine for the displacement of crop, said machine comprising a pair of spaced apart air-permeable rotatable screens which each define an interior air chamber, means for rotating said screens in opposite directions towards each other relative to the normal direction of travel of said machine, air evacuation means located in each said chamber for providing that the air pressure in each said chamber is less than the air pressure surrounding said chambers whereby air flows into each chamber through its corresponding permeable screen to draw crop against each said air-permeable screen, said crop being thereafter displaced by the rotation of each of said air-permeable screens.

4,286,428

APPARATUS FOR DETWISTING TEXTILE FABRICS IN ROPE FORM

Mariano Bassani, Via Trento Trieste 7, Arcore (Milan), Italy

Filed May 2, 1980, Ser. No. 145,650
Claims priority, application Italy, May 4, 1979, 67934 A/79
Int. Cl.³ D06C *3/06*
U.S. Cl. 57--1 UN **12 Claims**

1. Improved apparatus for untwisting a textile length which has become gathered together and twisted into the form of a rope, said apparatus comprising:

a main support structure,

a mounting structure carried by the support structure and angularly adjustable in position relative thereto,

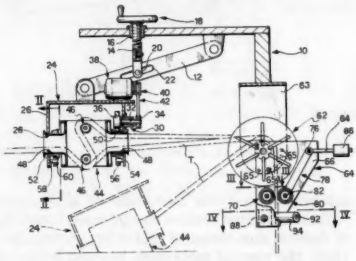
a guide having a textile entry and a textile exit which together define a main axis of guiding for a textile passed through said guide,

means for mounting said guide in said mounting structure for rotation about its guiding axis,

at least one elongate element carried by the guide and arranged to engage a said textile length extending through the guide between said textile entry and exit; said elongate element being disposed transversely to and spaced from the guiding axis of the guide whereby to cause said textile length to follow a sinuous path therethrough,

drive means carried by the mounting structure and arranged to rotate the guide selectively in one or other sense of rotation, and

means for detecting twist in the rope-form textile length, said twist-detecting means being disposed downstream of the guide and being connected to control the operation of said drive means, the twist-detecting means including a pair of rifled rollers arranged for mutual axial displacement and between which the rope-form textile is arranged to pass,



twisting in said textile being effective to cause a mutual displacement of the two rollers in a direction dependent on the sense of twisting; wherein the improvement comprises the provision of said guide mounting means in the form of

respective annular tracks provided on said guide about said textile entry and exits, said tracks being coaxial with said guiding axis, and

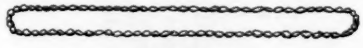
respective pluralities of rollers mounted on said mounting structure in correspondence with said tracks, the rollers of each said plurality being rotatable about respective axes parallel to said guiding axis, and being spaced circumferentially around the corresponding said track in contact therewith, one said roller serving as a drive roller and being drivingly coupled to said drive means.

4,286,429

POLYPROPYLENE ENDLESS LOOP AND THE METHOD THEREFOR

Spencer B. T. Lin, No. 12-3, Lane 2, Suei-Duei-Tze, Tamsui, Taipei, Taiwan

Continuation of Ser. No. 896,551, Apr. 14, 1978, abandoned. This application Sep. 25, 1979, Ser. No. 78,841
Int. Cl.³ D02G *3/36*; B65D *63/00*; D02G *1/20*
U.S. Cl. 57—201 **9 Claims**



1. A polypropylene endless loop having a transverse length of from about 7.5 to 35 cm and exhibiting a tensile strength of at least 6 Kgs obtained by cutting a polypropylene tubular sheet of from about 0.03 to 0.1 mm in thickness and 15 to 50 mm in transverse length into longitudinal lengths of from about 10 to 60 mm, transversely drawing the same at a draw ratio of at least 4 to provide a resulting transverse length of from about 7.5 to 35 cm, then twisting the same to form an endless twisted loop.

3. A method for preparing a polypropylene endless twisted loop suitable for packaging purposes comprising the steps of

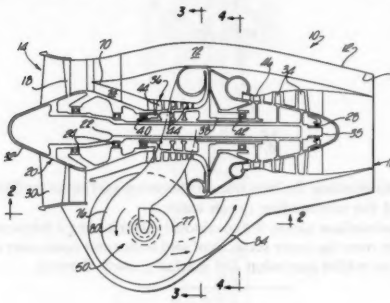
blow-moulding polypropylene into tubular sheet, having dimensions of from about 15 to 50 mm in transverse length and from about 0.03 to 0.1 mm in thickness, cutting said sheet to form individual endless loops having a longitudinal length of from about 10–60 mm, drawing said loops transversely with respect to the longitudinal axis thereof at a draw ratio of at least 4, and then twisting said drawn loops to form an endless twisted loop.

4,286,430

GAS TURBINE ENGINE

Raymond Smith, Monclova, Ohio, assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Sep. 17, 1979, Ser. No. 76,391
Int. Cl.³ F02C *3/10*
U.S. Cl. 60—39.16 R **9 Claims**



1. A gas turbine engine comprising:

a housing having an air inlet and an exhaust outlet;

fluid passage means formed through said housing between said inlet and said outlet;

a low pressure spool assembly comprising a first shaft rotatably mounted in the housing, at least one low pressure compressor stage disposed in said fluid passage means and secured adjacent one end of said first shaft, and at least one low pressure turbine stage disposed in said fluid passage means and secured adjacent the other end of the shaft;

an intermediate pressure spool assembly comprising a second shaft rotatably mounted in said housing, at least one intermediate pressure compressor stage disposed in said fluid passage means immediately downstream from said low pressure compressor stage and secured adjacent one end of said second shaft, at least one intermediate pressure turbine stage disposed in said fluid passageway upstream from said low pressure turbine stage and secured to said second shaft adjacent its other end;

a high pressure spool assembly comprising a third shaft rotatably mounted in said housing, at least one high pressure compressor stage disposed in said fluid passage means downstream from said intermediate pressure compressor stage and secured adjacent one end of said third shaft, at least one high pressure turbine stage disposed in said fluid passage means upstream from said intermediate pressure turbine stage and secured to said third shaft adjacent its other end;

combustor means for burning a fuel between said high pressure compressor and turbine stages;

wherein said first and second shafts are coaxial with each other; and

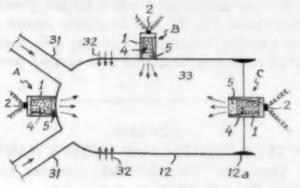
wherein the axis of said third shaft is substantially perpendicular and radially offset with respect to the axis of said first or second shaft so that said high pressure spool assembly straddles the low and intermediate pressure spool assemblies.

4,286,431

IGNITION SYSTEM FOR COMBUSTIBLE GASES OR LIQUIDS

Michel Reichard, Pessac, and Georges Krassoulia, Le Bouscat, both of France, assignors to Societe Europeene de Propulsion, Puteaux, France

Filed Mar. 28, 1979, Ser. No. 24,676
Claims priority, application France, Mar. 28, 1978, 78 08957
The portion of the term of this patent subsequent to Oct. 16, 1996, has been disclaimed.
Int. Cl.³ F02C *7/26*
U.S. Cl. 60—39.82 E **14 Claims**



1. An ignition system comprising an igniter, constituted by a receptacle, an ignition initiator disposed at one end of said receptacle, and a solid charge placed inside the receptacle, the solid charge comprising pyrotechnic compositions and reactive divided metals capable of reacting with one another exothermically, said compositions successively comprising, from the end of the receptacle carrying the initiator, a pyrotechnic ejection composition, a pyrotechnic ignition composition, and reactive divided metals respectively of decreasing activity, wherein;

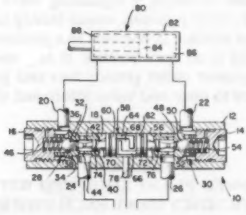
the igniter is associated with a combustion chamber containing a fluid constituted by liquid products or formed by mixtures of gases and liquids or solid particles, to ensure, by projection of said solid charge within said fluid, the heating or ignition of said fluid.

4,286,432

LOCK VALVE WITH VARIABLE LENGTH PISTON AND HYDRAULIC SYSTEM FOR A WORK IMPLEMENT USING THE SAME

J. W. Burrows, Yates City, and Loyal O. Watts, Mapleton, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US79/00664, § 371 Date Aug. 30, 1979, § 102(e) Date Aug. 30, 1979, PCT Pub. No. WO81/00600, PCT Pub. Date Mar. 5, 1981.
This PCT application filed Aug. 30, 1979, Ser. No. 93,072
Int. Cl.³ F16D *31/02*
U.S. Cl. 60—404 **20 Claims**



1. An expandable piston lock valve (10) adapted to operate both as a lock valve and a longstem lock valve comprising a valve housing (12) defining an internal valve chamber (18), a pair of spaced valve inlet ports (24,26) in said valve housing (12) communicating with said valve chamber (18), a pair of spaced valve outlet ports (20,22) in said valve housing (12) communicating with said valve chamber (18), first normally closed check valve means (28) interposed between a first valve inlet and outlet port (24,20) to control the flow of fluid therebetween, second normally closed check valve means (30) inter-

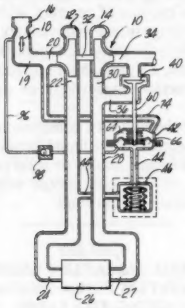
posed between a second valve inlet and outlet port (26,22) to control the flow of fluid therebetween, variable length piston means (58) mounted between said first and second check valve means (28,30) for operation in a first mode to permit both said first and second check valve means (28,30) to close simultaneously in the absence of fluid pressure supplied to either one of said pair of inlet ports (24,26) and in a second mode to prevent said first and second check valve means (28,30) from both closing simultaneously either in the presence or absence of fluid pressure supplied to either one of said pair of inlet ports (24,26), said variable length piston means (58) in said first mode having a first predetermined length and in said second mode expanding to a second predetermined length greater than said first predetermined length, and actuation means (68,78) for causing said variable length piston means (58) to expand from said first predetermined length to said second predetermined length.

4,286,433

CONTROL SYSTEM FOR TURBOCHARGER

Charles A. Detweiler, Durand, Mich., assignor to Schmelzer Corporation, Durand, Mich.

Filed Oct. 11, 1979, Ser. No. 83,860
Int. Cl.³ F02B 37/00
U.S. Cl. 60—602 **18 Claims**



1. A control system for a turbocharger having a compressor driven by a turbine comprising; valve means movable to alter the volume of exhaust gasses supplied to drive the turbine to control pressure of fluid discharge from the compressor, motor means to move the valve means between open and closed positions, control means disposed in a position to regulate communication between said outlet of said compressor and said motor means including a regulating valve movable between open and closed positions, means biasing said regulating valve to a closed position in response to a predetermined absolute pressure and to an open position in response to pressure from said compressor outlet greater than said predetermined absolute pressure to open said valve means and alter the speed of said turbine.

4,286,434

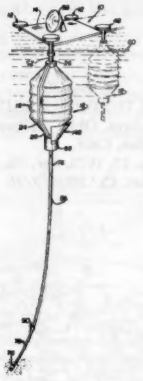
SOLAR POWER PLANT EQUIPPED WITH HIGH EFFICIENCY HEAT EXCHANGERS

Roger F. Moisdon, 4875 SW. 28th Ave., Fort Lauderdale, Fla. 33312

Filed Dec. 19, 1978, Ser. No. 969,451
Int. Cl.³ F03G 7/04
U.S. Cl. 60—641 B **1 Claim**

1. A submerged power plant for converting the potential energy of ocean thermoclines to usable energy including a submerged boiler for vaporizing a working fluid as a result of a heat exchange with the relatively warm surrounding surface water, a turbine for work expanding the vaporized working fluid from the boiler, and a submerged condenser for liquifying the exhaust from the turbine as a result of a heat exchange with the relatively cold surrounding subsurface water, the improvement comprising:

wiper means affixed to each of said boiler and condenser for cleaning the outer surfaces of said boiler and condenser so



as to enhance the heat transfer between said outer surfaces and the surrounding ocean water,

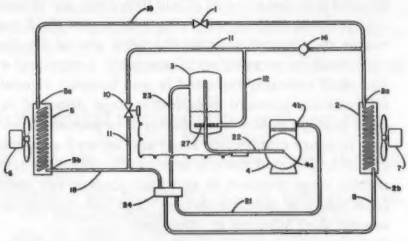
and subsurface means for continously distributing a lubricant film over the outer surfaces of said boiler and condenser so as to inhibit corrosion and marine growth thereon.

4,286,435

HOT GAS DEFROST SYSTEM

Peter L. Cann, Canastota, and Paul S. Sacks, Cazenovia, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 947,980, Oct. 2, 1978, Pat. No. 4,215,555.
This application Dec. 12, 1979, Ser. No. 103,834
Int. Cl.³ F25B 41/00
U.S. Cl. 62—81 **4 Claims**



1. A method of defrosting a heat exchanger coil in a refrigeration system comprising the steps of:

discharging a portion of the gaseous heat exchange fluid from a compressor outlet into the inlet of a heat exchanger coil having ice accumulated thereon;

circulating the heat exchange fluid through the coil wherein at least a portion of said heat exchange fluid is condensed such that heat is extracted therefrom to melt the ice accumulated on the coil;

passing the condensed heat exchange fluid from the heat exchanger coil outlet into an accumulator which serves as a reservoir for refrigerant during heat transfer operations and a heat interchanger during defrost operations;

by-passing a portion of the gaseous heat exchange fluid discharged from the compressor outlet and introducing said portion in heat exchange relationship with the liquid

heat exchange fluid in the accumulator from the step of passing to thereby vaporize at least a portion of the liquid contained therein; and

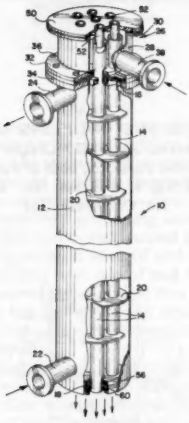
conducting gaseous heat exchange fluid from the accumulator into the compressor inlet.

4,286,436

FALLING FILM FREEZE EXCHANGER

Gerald E. Engdahl, Wheaton; James A. Nail, Carol Stream, and Vincent F. Allo, Warrenville, all of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Jun. 16, 1980, Ser. No. 160,112
Int. Cl.³ B01D *9/04*; C02F *1/22*
U.S. Cl. 62—123 **31 Claims**



1. A falling film freeze exchanger comprising:

a plurality of spaced apart vertical freeze tubes secured in, and penetrating, an upper and a lower tube sheet;

a shell around the tube sheets and connected thereto;

the ends of the freeze tubes extending above the upper tube sheet;

a weir tube telescoping, with clearance, the top portion of each freeze tube;

means to deliver a liquid feed stream into a feed box partially defined by the upper tube sheet; and

means to deliver a cooling fluid around the tubes inside of the shell between the upper and lower tube sheets; and

means to remove cooling fluid therefrom.

4,286,437

ENERGY SAVING REFRIGERATION SYSTEM

Fayez Abraham, and Edward Bowman, both of Niles, Mich., assignors to Tyler Refrigeration Corporation, Niles, Mich.

Filed Jul. 13, 1979, Ser. No. 57,350
Int. Cl.³ F25D *21/06*; F25B *39/04, 47/00*
U.S. Cl. 62—151 **32 Claims**

15. A refrigeration system including a gas defrost mechanism, said system comprising:

compressor means for compressing gaeous refrigerant having a relatively high temperature to a relatively high pressure;

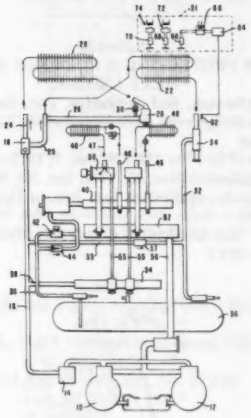
condenser means coupled to said compressor means for condensing the gaseous refrigerant to a liquid;

a plurality of evaporator means coupled in parallel for evaporating the liquid refrigerant at a relatively low pressure;

suction means for returning evaporated refrigerant from said evaporator means to said compressor means;

defrost means coupled to said compressor means for conducting gaseous refrigerant from said compressor means to said evaporator means;

means for selectively connecting the low pressure side of said evaporator means to said suction means and said defrost means in dependence upon whether said evaporator means is selected to be in a regrigeration mode or defrost mode of operation, respectively; and



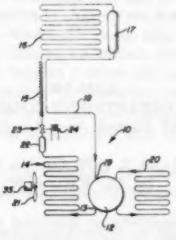
flow period control means for enabling the flow of gaseous refrigerant to said evaporators during a defrost mode of operation, when selected, and after a first time period terminating such flow while preventing said evaporator means from returning to the refrigeration mode of operation for a second set time period of a sufficient duration so as to allow for condensation around said evaporator means to drain.

4,286,438

CONDITION RESPONSIVE LIQUID LINE VALVE FOR REFRIGERATION APPLIANCE

Clarence C. Clarke, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 2, 1980, Ser. No. 146,357
Int. Cl.³ F25B *41/04*
U.S. Cl. 62—216 **17 Claims**



1. In a refrigeration system having a refrigerant fluid compressor having a suction inlet and a high pressure fluid outlet, a condenser connected to said compressor outlet for receiving compressed refrigerant therefrom, and an evaporator connected to said compressor suction inlet, a fluid flow control means connected between said condenser and evaporator comprising:

a fixed restrictor;

a valve for controlling refrigerant fluid flow through the restrictor; and

means for controlling said valve to permit fluid flow therethrough whenever the compressor is running, and when the compressor is not running only in the event the pressure at the outlet of the compressor is above a preselected undesirable pressure, thereby to effect reduction of said pressure to below said preselected pressure to permit subsequent starting of the compressor.

4,286,439

SUIT FOR PROTECTING A PERSON'S BODY FROM HEAT AND GAS

Adalbert Pasternack, Bad Schwartau, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Continuation of Ser. No. 858,429, Dec. 7, 1977, abandoned. This application Nov. 20, 1979, Ser. No. 96,245

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1976, 2655953

Int. Cl.³ F25D *23/12;* **F25B** *49/00*

U.S. Cl. 62—259.3 **3 Claims**

1. A protective device for protecting a person's body from heat and gas, comprising a body suit covering the body, having a head portion with a viewing visor in the wearer's field of vision with a refrigeratant storage tank having a consumable refrigerant therein connected to said suit, a refrigerant conduit distributed over said suit, means for circulating refrigerant from said tank through said refrigerant conduit for cooling the body suit and the person's body, and indicator means including a connecting line connected to said tank and having a visual indicator which extends into the field of vision of the wearer and a device for continuously monitoring the amount of refrigerant present including a member in said tank bearing against the refrigerant and movable in response to changes in amount of the refrigerant so that this amount is shown in said visual indicator so as to indicate the state of refrigerant in said storage tank connected to said connecting line.

4,286,440

COMPARTMENT COOLER

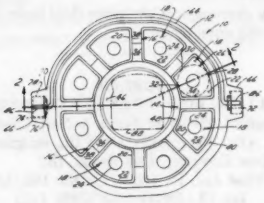
Frank Taylor, 9415 Central Ave., Lasalle, Quebec, Canada (H8R2K4)

Filed Oct. 3, 1979, Ser. No. 81,375

Int. Cl.³ F25D *3/08*

U.S. Cl. 62—457 **9 Claims**

1. A cooler comprising an insulated container, a lid for closing said insulated container, insulated partition means for separating the interior of said container into at least two compartments, one of said compartments being centrally located, said insulated partition means interposed between said two compartments to define a significant portion of a boundary between said compartments and a coolant means defining a further portion of said boundary, said coolant means being supported on the top of said one compartment, a first portion of the surface of said cooling means in communication with said one compartment and a second portion of said cooling means in communication with at least another of said compartments in a manner such that said first portion absorbs heat from



said one compartment and said second portion absorbs heat from said another compartment.

4,286,441

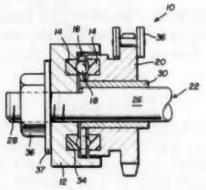
AUTOMATIC SLIP COUPLING ASSEMBLY

Herbert T. Scheneman, Jr., 11333 Oregon Cir., and Karl F. Maggio, 2200 Grove Park Rd., both of Fenton, Mich. 48430

Filed Sep. 4, 1979, Ser. No. 71,969

Int. Cl.³ F16D *7/02*

U.S. Cl. 64—30 C **6 Claims**



1. A slip coupling assembly for coupling drive means to a tubular means, said tubular means including a driving shaft extending therefrom, said coupling assembly comprising:

sprocket means being freely rotatably mounted to said driving shaft of said tubular means, said sprocket means including a resilient portion, said drive means being connected to said sprocket means;

clutch plate means being fixedly mounted to said driving shaft of said tubular means, said clutch plate means including a resilient portion;

said resilient portions of said clutch plate means and said sprocket means being donut-shaped resilient rings, one of said donut-shaped resilient rings being mounted in an annular channel of said sprocket means and the other donut-shaped resilient ring being mounted in an annular channel of said clutch plate means;

a plurality of rollers being mounted to a retainer ring, said rollers and retainer ring being sandwiched between said clutch plate means and said sprocket means, and said rollers being sandwiched between said resilient portions of said clutch plate means and said sprocket means;

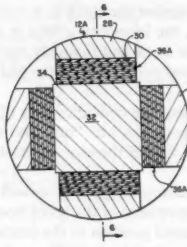
said sprocket means being powered for rotative movement by said drive means, and the powered rotative movement of said sprocket means being transmitted through said resilient portions and said rollers to said clutch plate means whereby said tubular means being driven; and

said tubular means being capable of disengagement from said drive means whereby said sprocket means continues to be rotated by said drive means and said clutch plate means being stopped from rotation due to torque-limiting slip which occurs between said rollers and said resilient portions.

4,286,442
FLEXIBLE COUPLING

Robert R. Peterson, Hudson, Mass., assignor to Barry Wright Corporation, Watertown, Mass.

Filed Feb. 7, 1979, Ser. No. 9,8[illegible]
Int. Cl.[3] F16D *3/04*
U.S. Cl. 64—31 10 Claims



1. In a flexible coupling of the type comprising a driving member rotatable about a first axis; a driven member rotatable about a second axis; and an intermediate member; said driving and driven members each including means defining a first pair of spaced apart bearing surfaces; and said intermediate member including means operatively connecting said driving member to said driven member and having second and third pairs of spaced-apart bearing surfaces; each of said second and third pairs being (a) associated with one of said first pairs and (b) disposed with respect to the associated first pair so that each bearing surface of a first pair is disposed adjacent and opposite to a respective bearing surface of the second or third pair, the improvement comprising:

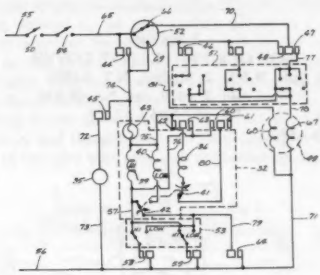
bearing means coupling each of the bearing surfaces of said driving and driven members to a different bearing surface of said intermediate member, said bearing means comprising a plurality of elastomeric laminated bearing units, ech disposed between and engaging one of the bearing surfaces of said second and third pairs and an adjacent bearing surface of one of said first pairs; wherein each of said elastomeric laminated bearing units comprises alternate layers of an elastomeric material and a nonextensible material; and wherein said bearing surfaces of said second and third pairs are cylindrical surfaces and said bearing surfaces of said first pairs are flat surfaces, and each of said bearing units includes a cylindrical section and a flat section engaging respectively the corresponding cylindrical and flat surfaces.

4,286,443
ASSURED SLOW SPEED SPIN FOR FABRIC WASHING MACHINE

William H. Hunter, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Mar. 31, 1980, Ser. No. 135,473
Int. Cl.[3] D06F *33/02*
U.S. Cl. 68—12 R 6 Claims

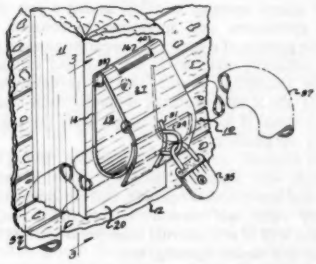
1. A control system for a fabric washing apparatus operable through a plurality of cycles and including an agitator within a rotatable fabric-receiving basket and drive means selectively operable for driving each of said agitator and basket at a first relatively low speed and a second relatively high speed, the combination comprising: sequential control means for controlling said apparatus through a predetermined sequence of events defining said plurality of cycles; cycle selection means for selecting a particular one of said plurality of cycles; speed selection means operable independently of said cycle selection means and including switch means for effecting one of the speeds of said drive means; and circuit means associated with said sequential control means and said drive means and actuated during a predetermined portion of said particular one cycle to provide a bypass circuit relative to said switch means for overriding said speed selection means and operating said drive means in the other of said speeds during the predetermined portion of said particular one cycle and permitting operation at the selected speed for the balance of the cycle.



4,286,444
HAND PROPELLED YARD MACHINERY HANG-LOCK DEVICE

Nicholas Grudich, 17285 Meryweather, Mount Clemens, Mich. 48044

Filed Apr. 5, 1979, Ser. No. 27,310
Int. Cl.[3] E05B *65/48*
U.S. Cl. 70—13 1 Claim



1. A hang-lock device adapted to be fastened to a wall for hanging and locking a hand propelled machine to prevent theft thereof comprising:

walls defining a generally rectangularly outlined, flat, sheet metal bracket portion having a front face and a wall contacting face and side edges;

a cantilevered, jaw-like cavity portion attached to the bottom edge of said bracket portion coterminious therewith width-wise depending downwardly and forwardly in substantially circular cylindrical outline upwardly to a cavity lip disposed horizontally with the bottom of said cavity;

spaced screw openings to fasten the device to such wall extending through said front and rear faces of said bracket portion;

walls defining an elongated sheet metal upper leaf pivotably hinged by a hinge pin to the upper edge of said bracket portion, said hinge pin being capped to prevent removal thereof after installation, said leaf depending downwardly and outwardly from said hinge pin so as to overlap said lip a substantial distance below said lip and jaw cavity, said latch leaf having at its lower portion below said lip a slotted opening for receiving a hasp therethrough; and a U-shaped hasp member having its ends fixedly attached to said jaw-like member below and adjacent said lip so that

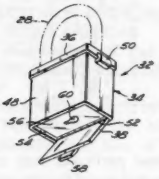
when said leaf is closed the hasp extends through said leaf preventing said leaf from being opened when a locking means is passed through said hasp.

4,286,445

PADLOCK PROTECTIVE COVER

William G. Sills, R.F.D. 2, Medina, N.Y. 14103

Filed Aug. 3, 1979, Ser. No. 63,520
Int. Cl.[3] E05B *67/38*
U.S. Cl. 70—55 1 Claim



1. A padlock protective cover comprising:

an enclosed housing including a side wall assembly constructed of flexible sheet material, said side wall assembly having an upper access opening and a lower access opening each of which connects with an interior chamber, said interior chamber adapted to contain the body portion of a padlock;

a top hingedly connected by a first "living hinge" assembly to said side wall assembly, said top capable of tightly connecting with said side wall assembly to close said upper access opening, said top having a pair of spaced-apart aperatures, said aperatures to connect with the shackle portion of a padlock, a separate annular protuberance integrally attached to said top and extending outwardly therefrom, a said annular protuberance being located about said aperture, whereby each said annular protuberance is to tightly connect with the shackle portion of the padlock;

a bottom hingedly connected by a second "living hinge" to said side wall assembly, said bottom being movable to close said lower access opening, said bottom being located entirely within said internal chamber and in snug contact with the wall of said internal chamber when said bottom is closing said access opening; and

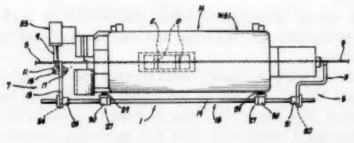
a tab attached to said bottom and protruding outwardly from said side wall assembly when said bottom is in the closed position, said tab to facilitate manual hinging movement of said bottom.

4,286,446

MACHINE CONTROL APPARATUS

Edgar F. Saffley, Florissant, Mo., assignor to ACF Industries, Inc., New York, N.Y.

Filed Jun. 5, 1979, Ser. No. 45,603
Int. Cl.[3] B21B *33/00;* B21D *55/00;* F16D *71/00*
U.S. Cl. 72—5 4 Claims



1. Apparatus for controlling a machine drawing stock from a source thereof to a first work station at which a first operation is performed on the stock, the stock being delivered from the first work station to a second work station as the first operation is completed so a second operation may be performed on the stock at the second work station, the machine having an electromechanical system which drives the machine to perform the work at the work station and move the stock, the electromechanical system including a switch for energizing and deenergizing the system, and the switch having a contactor arm extending outwardly from the machine, the apparatus comprising:

a lever arm bearing against the stock as it moves toward the first work station, the lever being held in a first position when engaging the stock and rotatably movable from the first toward a second position when the end of the stock is reached;

a contactor for moving the contactor arm of the switch to turn the switch from "on" to "off" and deactivate the electromechanical system thereby terminating the drawing of stock; and,

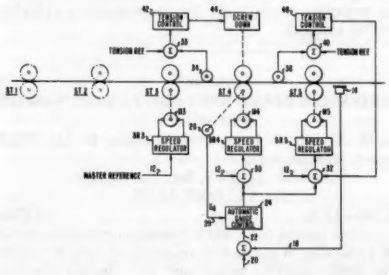
a rod rotatably interconnecting the lever and the contactor for transmitting movement of the lever from its first position toward its second position to the contactor, the contactor moving the switch to its "off" position in response to movement of the lever, the lever being attached to one end of the rod, the contactor being attached to the other end of the rod and the rod being positioned substantially parallel to the path of stock through the machine so that said rod is rotatable about an axis extending parallel to said stock path.

4,286,447

METHOD AND APPARATUS FOR AUTOMATIC GAUGE CONTROL SYSTEM FOR TANDEM ROLLING MILLS

Robert S. Peterson, Williamsville, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 12, 1979, Ser. No. 19,530
Int. Cl.[3] B21B *37/06*
U.S. Cl. 72—9 3 Claims



1. The method of controlling the final output gauge of strip material passing through a tandem rolling mill including 1, 2, . . . n stands, comprising the steps of: varying the speed of the $(n-1)^{th}$ in relation to an inputted thickness into said $(n-1)^{th}$ stand and to a desired delivery gauge at the output of said n^{th} stand; with said n^{th} stand having rolls which have been sand-blasted for effecting rough surfacing treatment of said strip material therethrough; and varying the speed of said n^{th} stand substantially by the same speed percentage as said $(n-1)^{th}$ stand.

4,286,448

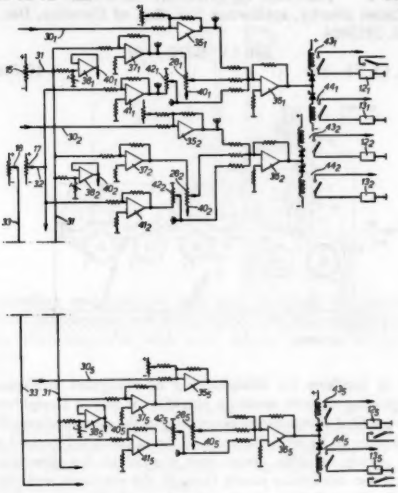
MILL CONTROL

Geoffrey Houghton, Colehill, England, assignor to Loewy Robertson Engineering Co. Ltd., Poole, England

Filed Nov. 13, 1979, Ser. No. 93,187

Int. Cl.³ B21B *37/00, 13/14*

U.S. Cl. 72—21 **6 Claims**



1. Control equipment for at least some of the eccentrically mounted collars of a cluster mill, comprising:

(a) a control circuit for each said controlled collar for setting said collar to a determined displacement;

(b) a control signal generating circuit for each said controlled collar;

(c) means for generating a first magnitude signal proportional to a desired crown magnitude;

(d) means for generating from said first magnitude signal a series of crown datum signals, one for each said controlled collar, said series of crown datum signals being proportional to said first magnitude signal in a preselected ratio;

(e) selection means for preselecting said ratio;

(f) means for supplying a position signal representing the displacement of each said controlled collar;

(g) each of said control signal generating circuits being connected to receive an associated one of said crown datum signals and a corresponding position signal;

(h) whereby each said control signal is dependent on the difference between its said position signal and the associated crown datum signal.

4,286,449

MACHINE FOR MECHANICAL PICKLING OF WIRES WITH THE AID OF ROLLING

Bruno Spreafico, Via Valle Scura 2, Malgrate (Como), Italy

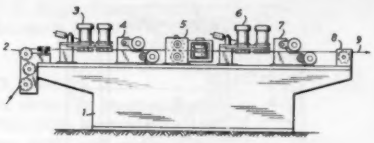
Continuation-in-part of Ser. No. 832,064, Sep. 9, 1977, abandoned. This application Mar. 30, 1979, Ser. No. 25,596

Claims priority, application Italy, Sep. 21, 1976, 27415/76; Nov. 15, 1976, 29328/76

Int. Cl.³ B21B *45/04, 45/02*

U.S. Cl. 72—40 **4 Claims**

1. An apparatus for rolling and cleaning small diameter metal wires being advanced into said apparatus, said cleaning apparatus being driven by independent means, comprising in combination: a supporting planer on which said apparatus is positioned a first set of rotary brushes arranged in pairs on said apparatus and being disposed at the sides of the advancing wire, said brushes in each pair having axes with the axes of adjacent pair of brushes being substantially perpendicular with respect to one another, each of said rotary brushes being flanged throughout their diameter so as to laterally compress and maintain alignment of the bristles of each of said brushes and being rotated by an independent motor in a direction opposite to wire feed direction, said brushes further defining an enclosed section or arc of about 180° of the wire, said brushes having bristles with tips co-acting in respect of the advancing wire by a flange holding action formed at the interface thereof, wire rolling means downstream of said first set of brushes; a second set of said flanged rotary brushes arranged in pairs on the sides of the wire with each pair of brushes having axes and



the axes of adjacent pairs of brushes being substantially perpendicular with respect to one another, each of said brushes being rotated by an independent motor in a direction opposite to the wire advance direction to define an enclosed sector or arc of about 180° of the wire, wherein the bristles of said set of brushes coact with surfaces of the advancing wire in response to a restraining action by said flange restraining means formed at the interface thereof to permit a minimum and constant tip bending at a tangent with respect to the bristles; and counterweight pressure means for pressing said brushes against the wire penetrating into the brushes, without substantial spreading of the bristles of the latter as said brush bristles are being worn out.

4,286,450

APPARATUS FOR MANUFACTURING CORRUGATED TUBES

Eduard M. Godin, ulitsa Begovaya, 22, korpus 3, kv. 212; Vladimir A. Anoshko, ulitsa Shosseinaya, 58, korpus 1, kv. 84; Anatoly N. Gavrilov, Kutuzovsky prospekt, 43, kv. 118, all of Moscow; Almas F. Akhmerov, ulitsa Kosmonavtov, 2, kv. 19, Kazan; Garik E. Zverkov, ulitsa Oktyabrskoi revoljutsli, 24, kv. 40; Valentin P. Semenov, prospekt Stroitelei, 8, kv. 40, both of Smolensk; Vladimir V. Grachev, ulitsa Bobruiskaya, 22, kv. 82, Moscow; Valentin M. Chepurin, ulitsa Starodemidovskaya, 8b, kv. 28, Smolensk; Viktor Y. Mikhailov, 4 mikroraion, 29, kv. 226, Angarsk, and Sergei I. Rybnikov, ulitsa Supruna, 3/5, kv. 3, Moscow, all of U.S.S.R.

Filed Dec. 20, 1979, Ser. No. 105,857

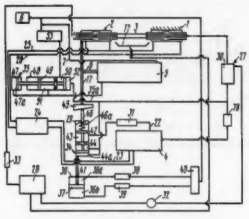
Claims priority, application U.S.S.R., Feb. 3, 1978, 2570051

Int. Cl.³ B21D *15/06*

U.S. Cl. 72—59 **7 Claims**

1. An apparatus for manufacturing corrugated tubes from a tubular billet comprising: a bed; a unit for clamping and sealing a tubular billet installed on said bed; a hydraulic drive of said clamping and sealing unit installed on said bed; a liquid source of said hydraulic drive; a compressed gas source; a device for axial compression of the tubular billet communicating with

said compressed gas source and installed on said bed; a source of forming liquid; a device for delivering pressurized liquid from said liquid source into the tubular billet for forming the corrugated tube installed on said bed; a pressure regulator of said forming liquid delivery device; tools installed on said bed symmetrically with relation to the direction of compression of the tubular billet with a provision for reciprocating across said direction of compression for at least partial encompassing of the tubular billet; a drive for reciprocating said tools; a device for programmed pressure control inside the tubular billet,



connected by its input to said hydraulic drive and by the output, to the space of the tubular billet; a device for programmed control of axial compression force connected by its input to said compressed gas source and by the output, to said axial compression device for displacing the movable member thereof; said device for programmed pressure control inside the tubular billet and said device programmed control of axial compression force interconnected operationally for synchronous changes of the axial compression force and of pressure inside the tubular billet.

4,286,451

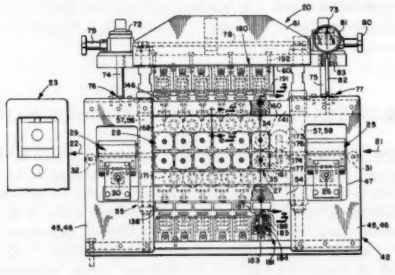
FORMING LEVELLER

William J. H. Chang, Rocky River, Ohio, assignor to The Yoder Company, Cleveland, Ohio

Filed Jun. 18, 1979, Ser. No. 49,491

Int. Cl.³ B21C *1/02, 5/14*

U.S. Cl. 72—161 **51 Claims**



1. A multiple pass forming leveller for shaping variable thickness elongated stock to one or more planes of reference comprising a leveller having upper and lower fixed and floating stock engaging rolls at each pass, each floating roll being opposed to a fixed roll to compensate for variations in stock thickness.

35. A stock leveller comprising a bottom set of stock engaging rolls and a top set of stock engaging rolls, shafts for the rolls of each set, a bottom fixed frame mounting the shafts of the top set of rolls and a top movable frame mounting the shafts of the bottom set for movement with respect to the top set.

4,286,452

MACHINE FOR STRAIGHTENING ELONGATED WORKPIECES

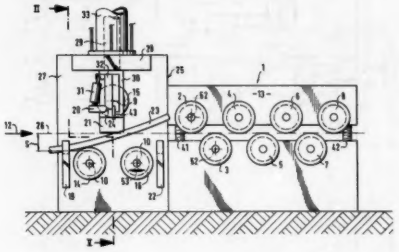
Horst Schneider, Leichlingen, Fed. Rep. of Germany, assignor to Th. Kieserling & Albrecht Werkzeugmaschinenfabrik, Solingen, Fed. Rep. of Germany

Filed Dec. 10, 1979, Ser. No. 102,323

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1978, 2855014

Int. Cl.³ B21C *3/02*

U.S. Cl. 72—164 **10 Claims**



1. A machine for straightening of elongated workpieces, comprising support means; a plurality of driven straightening rolls profiled substantially according to the cross-section of the workpiece to be straightened and being mounted on said support means turnable about axes normal to the direction in which the workpiece passes through the machine, said plurality of rolls including, as considered in said direction a first, a second and a third roll mounted in said support means in such a manner so as to be accessible from one side of the machine; means for adjusting the position of at least some of the other rolls towards the workpiece; means for adjusting the position of said second roll in a plane normal to said passing through direction and including the axis of said second roller, relative to said first and third roll and independent from the adjustment of the position of said other rolls; and at least partly movable means in the region of the first three rolls for centralizing the workpieces relative thereto.

4,286,453

DEVICE FOR SECURING THE DUMMY BLOCK ON THE PRESS STEM OF METAL-EXTRUSION PRESSES

Klaus Exner, Dusseldorf, Fed. Rep. of Germany, assignor to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed May 16, 1979, Ser. No. 39,664

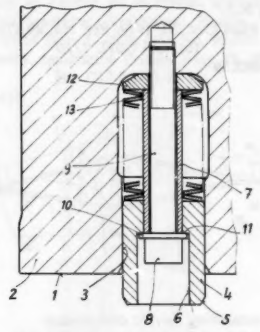
Claims priority, application Fed. Rep. of Germany, May 20, 1978, 7815260[U]

Int. Cl.³ B21C *25/00*

U.S. Cl. 72—273 **3 Claims**

1. In a press stem for a metal extrusion press having a dummy block and retainer therefor, the improvement comprising a central blind bore in the end face of the press stem extending only partly through said stem, a dummy block retaining bolt slidable in said blind bore having a chamfered outer edge and a coaxial hole therethrough and a counterbore in the outer end thereof, resilient means in said blind bore for urging said bolt out of said blind bore for engagement in a bore hole in an aligned dummy block to removably support said dummy block on said end face, and adjustable means in said blind bore for retaining said bolt in said blind bore and controlling the amount the bolt projects from said end face while allowing said bolt to retract within said blind bore against the urgining of said resilient means, said adjustable means comprising a threaded bolt having an enlarged head extending through said hole and engaging a correspondingly-threaded bore in the inner end of said blind bore with said threaded bolt head situated in said counterbore, a washer between said bolt head and

the shoulder between said hole and said counterbore, said bolt head and washer retaining said dummy block retaining bolt in said blind bore, and a tubular spacer of predetermined length



surrounding said threaded bolt and extending between said washer and the inner end of said blind bore, said tubular spacer being interchangeable with other tubular spacers of varying lengths.

4,286,454

APPARATUS FOR FORGING SHAFT FLANGES

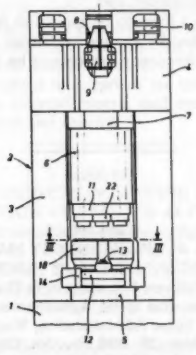
Horst Bachmann, Rödental-Waldsachsen, Fed. Rep. of Germany, assignor to Langenstein & Schemann Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 20, 1979, Ser. No. 59,162

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1978, 2833181

Int. Cl.³ B21D *43/14*

U.S. Cl. 72—356 **7 Claims**



1. Apparatus for forging a shaft flange in one or more preforming operations and a finish-forging operation comprising a forging press having a support stand with a fixed press plate, a moving platen movable relative to said fixed plate, a rotatable table mounted on said fixed plate, an upper finish-forging die on said moving platen, said die being located substantially in alignment with a central axis of said support stand, said rotary table having an axis of rotation spaced from said central axis, a plurality of like lower dies supported in a circle on said table around said axis of rotation, a plurality of upper preforming dies on said moving platen for cooperation with said lower dies and means for indexing said table about said axis of rotation to bring a lower die containing a workpiece to be forged sequentially into register with said upper preforming dies and with said finish-forging die, a first one of said upper preforming dies being positioned on one side of said finish-forging die and a second one of said upper preforming dies being positioned on the other side of said finish-forging die, said indexing means being adapted to rotate a lower die from alignment with said first upper die to alignment with said second upper die past said finish-forging die.

4,286,455

ULTRASOUND PHANTOM

Jonathan Ophir, Overland Park; Nabil F. Maklad, Lenexa, and Paul M. Jaeger, Kansas City, all of Kans., assignors to Acoustic Standards Corporation, Overland Park, Kans.

Filed May 4, 1979, Ser. No. 36,016

Int. Cl.³ G01N *37/00*

U.S. Cl. 73—1 DV **13 Claims**

1. An ultrasound phantom comprising:

a substantially air-tight enclosure;

means within said enclosure for altering ultrasonic waves directed therethrough in a manner to yield desired ultrasound characteristics,

said wave-altering means including a quantity of a cellular foam material, and a fluid dispersed throughout said material.

4,286,456

GAS CHROMATOGRAPHIC CHAMBER

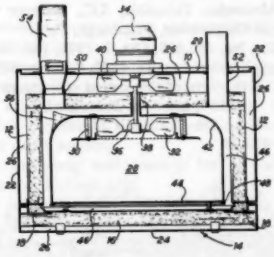
Giorgio Sisti, Melzo; Ermete Riva, Merate, and Learco Sala, Monza, all of Italy, assignors to Carlo Erba Strumentazione S.p.A., Italy

Filed Aug. 9, 1979, Ser. No. 65,333

Claims priority, application Italy, Nov. 22, 1978, 30052 A/78

Int. Cl.³ G01N *31/08*

U.S. Cl. 73—23.1 **9 Claims**

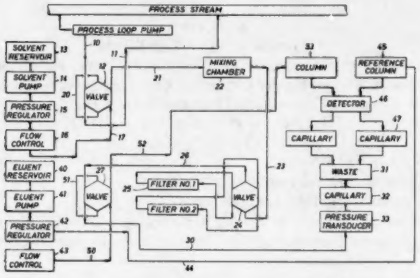


1. A gas chromatographic chamber comprising an outer envelope including insulated wall members defining said chamber which may be closed in an air-tight manner, an inner housing section within said chamber, said inner housing section adapted to include at least one chromatographic column and including inner housing section air distribution means for maintaining a uniform distribution of the air within said inner housing section and inner housing section heating means for heating the air within said inner housing section, non-thermally insulating partition means within said chamber and spaced from said insulated wall members so as to provide a pneumatically insulated space between said insulated wall members and said inner housing section, said non-thermally insulating partition means defining said inner housing section, and circulation means for creating a controlled circulation of fluid within said pneumatically insulated space so as to affect the temperature within said inner housing section.

4,286,457
VISCOSITY MEASUREMENT

Henry W. Johnson, Jr., Sugar Land, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 6, 1980, Ser. No. 127,701
Int. Cl.³ G01N *31/08, 33/44*
U.S. Cl. 73—53 4 Claims



1. A method for determining the solution viscosity of a polymer comprising:

performing a gel partition chromatography analysis of the polymer solution;

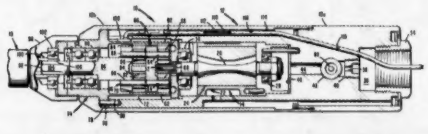
measuring the pressure drop in the flow line to the chromatography column caused by the passage of said polymer solution; and,

recording both said analysis and pressure drop in a correlatable manner.

4,286,458
FASTENER TOOLS

Robert H. Alexander, Columbia, S.C., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 404,689, Oct. 9, 1973, Pat. No. 4,223,555.
This application Jun. 21, 1977, Ser. No. 808,467
The portion of the term of this patent subsequent to Sep. 23, 1997, has been disclaimed.
Int. Cl.³ B25B *23/145*
U.S. Cl. 73—862.21 6 Claims

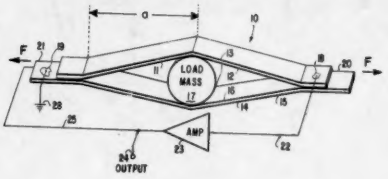


5. A transducer construction for a power tool or the like having a motor, a torque output member, and drive means connecting said motor with said torque output member, said transducer construction comprising an annular member adapted to encircle at least a portion of said drive means and having one end thereof adapted to be fixed against rotation relative to said output member, an internal gear means at the other end thereof for so connecting said annular member to said drive means as to subject said annular member to at least a portion of the torque being transmitted by said drive means, and torsional strain responsive means carried by said annular member and operable to provide a signal proportional to the torsional strain in said annular member and consequently to the torque output at said torque output member.

4,286,459
FORCE SENSOR

William S. N. Trimmer, Morris Plains, N.J., and Mark R. Laser, New York, N.Y., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Oct. 30, 1979, Ser. No. 89,670
Int. Cl.³ G01L *1/10*
U.S. Cl. 73—862.59 12 Claims



7. A force measuring device comprising:

a first strip of flexible piezoelectric material;

an electrically conductive coating on opposite sides of said first strip;

a second strip of flexible piezoelectric material;

an electrically conductive coating on opposite sides of said second strip;

said conductive coating on one side of said first strip being electrically coupled to the conductive coating on one side of said second strip adjacent to each end of said first and second strips;

said electrically coupled coatings on said first and second strips connected to a reference potential;

positive electrical feedback means coupled between the other conductive coating on said first strip and the other conductive coating on said second strip;

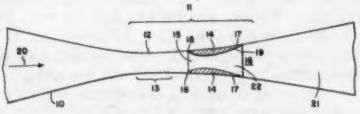
a mass located between said first and second strips intermediate the ends thereof; and

means to enable a force to be applied to at least one end of said strip(s) thereby causing said strips and said mass to oscillate at a frequency determined by the magnitude of said force.

4,286,460
WIND TUNNEL SUPPLEMENTARY MACH NUMBER MINIMUM SECTION INSERT

Lana M. Couch, Mathews, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 28, 1980, Ser. No. 135,040
Int. Cl.³ G01M *9/00*
U.S. Cl. 73—147 5 Claims



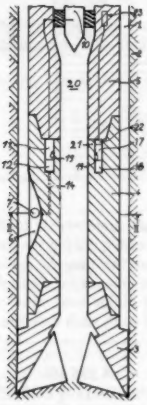
1. In combination with a wind tunnel having a nozzle with a first minimum section and a nozzle expansion area having walls, an apparatus for providing supplementary wind tunnel Mach numbers, said apparatus comprising a second minimum section insert releasably attached to said walls of said nozzle expansion area of said wind tunnel.

4,286,461

METHOD AND DEVICE FOR IN SITU DETECTION OF A MINERAL DEPOSIT FLUID WITHIN A BOREHOLE

Philippe Bres, Billere; Christian Berge, Pau, and Gerard Sassus-Bourda, Poey de Lescar, all of France, assignors to Societe Nationale Elf Aquitaine (Production), France

Filed Nov. 1, 1979, Ser. No. 90,358
Claims priority, application France, May 23, 1979, 79 13090
Int. Cl.[3] E21B 47/10
U.S. Cl. 73—155 10 Claims



1. A device for in situ detection and measurement of a mineral deposit fluid, of the type comprising an acoustic wave emitter and an acoustic wave receiver which are mounted on a drill collar substantially in the proximity of the drilling bit, means connected to the emitter and capable of generating at least one acoustic wave, means mounted partly on the drill collar and partly at the surface, said means being connected to the receiver and capable of processing the signals received by said receiver, wherein the emitter and the receiver are placed in oppositely-facing relation at a short distance from each other and are mounted on a part of the drill collar which is constituted by an external groove, said emitter and receiver being housed within said groove.

4,286,462

ACOUSTIC DETECTION OF WIND SPEED AND DIRECTION AT VARIOUS ALTITUDES

Ian A. Bourne, Nunawading, Australia, assignor to The University of Melbourne, Parkville, Australia

Filed Aug. 21, 1979, Ser. No. 68,331
Claims priority, application Australia, Aug. 22, 1978, PD5604
Int. Cl.[3] G01W 1/02
U.S. Cl. 73—189 14 Claims

1. Apparatus for the detection of wind speed and direction at various altitudes, comprising:

(a) means for transmitting to the atmosphere an acoustic pulse having a predetermined frequency spectrum;

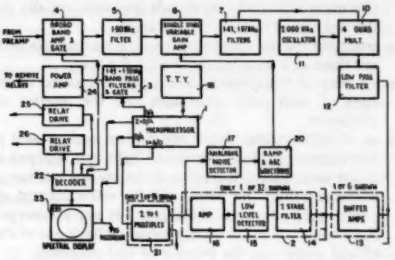
(b) means for receiving the energy of said pulse as scattered by the atmosphere to provide electrical signals;

(c) means for comb filtering said electrical signals to divide said electrical signals into a number of discrete frequency channels;

(d) means for generating a running mean of the output signal from each frequency channel; and means for substracting the mean from each output signal, whereby the influence of background noise and spurious signals is reduced;

(e) means for rejecting the output signals from the discrete frequency channels which do not satisfy predetermined noise criteria;

(f) means for determining the difference between the center frequencies of the transmitted pulse and the respective output signals from said discrete frequency channels which are not rejected to determine a velocity estimate of the wind in the direction of propagation; and



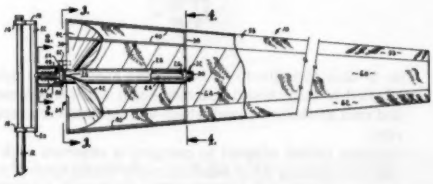
(g) means for assessing the reliability of the estimated velocity, and means for rejecting those velocity estimates falling below a predetermined level of reliability.

4,286,463

AIR SOCK

H. Ray Cole, R.R. 1, Rosendale, Mo. 64483

Filed Nov. 16, 1979, Ser. No. 95,511
Int. Cl.[3] G01W 1/02
U.S. Cl. 73—189 16 Claims



1. An instrument for indicating the speed of the wind, said instrument comprising:

a generally conically shaped member open at at least one end, said member being divided into longitudinally extending sections around its perimeter with each section being characterized by a visible marking distinguishing it from the other sections;

means for mounting said member for pivotal movement about its longitudinal axis;

means for acting on said member for resisting said pivotal movement about said longitudinal axis;

means for mounting said member for pivotal movement about a vertical axis in response to changes in wind direction; and

means for effecting said pivotal movement of said member about said longitudinal axis responsive to wind speed whereby one of said sections will be visible from an overhead position to provide an indication of wind speed.

4,286,464

OPTICAL FLUID LEVEL MONITOR

Thomas E. Tauber, Upper Darby, Pa., and James Magee, Palmyra, N.J., assignors to Technical Development Company, Glenolden, Pa.

Filed Jan. 14, 1980, Ser. No. 112,088
Int. Cl.[3] G01F 23/00
U.S. Cl. 73—293 7 Claims

1. An apparatus for monitoring the level of fluid in a container which comprises:

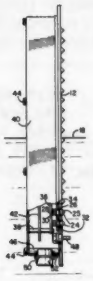
an array of sensors, each of said sensors being adapted to

provide a signal to indicate if said sensor is immersed in the fluid, said array being positioned in the container so that said array is substantially immersed in the fluid when the container is full, said array being aligned and adapted in a manner so that said signals may substantially indicate the fluid level within the container;

a processor means adapted to receive said signals and present them in a form more suitable for use;

a plurality of transparent conical prisms located so that the apex of each prism protrudes into the interior of said container;

a set of light sources fitted one behind each of said prisms and adapted to direct a beam of light into the base of said prism such that if the prism is below the surface of the contained fluid the beam will be refracted out of said prism and be lost but if the prism is not submerged, the light beam will be internally reflected back out of the base of said prism into the interior of said container;



a set of detectors fitted one behind the base of each prism adapted to receive said reflected beam when it is present and emit an electric signal which will indicate such reception;

a multiplex circuit adapted to energize in sequence each of said light sources while simultaneously testing each of said detectors to determine if it is emitting a signal indicative of a reflected light beam;

a counting circuit means adapted to count the number of detectors indicating reflected light and emit an electrical signal which is proportional to said number, said signal representing the height of the fluid in the container; and

a temperature compensation means adapted to develop a voltage representative of any errors in fluid level introduced by temperature changes in both the fluid and system components, and a summing junction wherein said proportional signal is summed with said error signal to produce a corrected electrical signal representing the true height of the fluid in the container being monitored.

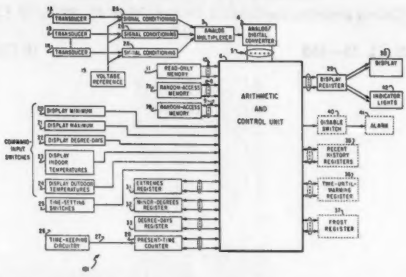
4,286,465

ELECTRONIC DEVICE TO RECORD TEMPERATURES AND THE TIME OF OCCURRENCE

Irving H. Thomae, Norwich, Vt., assignor to Trustees of Dartmouth College, Hanover, N.H.

Filed Sep. 17, 1979, Ser. No. 75,953
Int. Cl.[3] G01K *7/16*
U.S. Cl. 73—342 **15 Claims**

1. A digital min-max thermometer that comprises, in combination: temperature transducer means for periodically sensing the temperature in the surrounding environment and for providing a signal representative of that temperature; time keeping means to provide the corresponding time of occurrence of the temperature thus sensed; storage means for storing previously attained minimum and maximum values of temperature and the time of occurrence thereof; means for comparing the most recently sensed temperature with stored values of temperature for a limited subinterval of time to find local minimum and maximum temperatures for that subinterval, there being a set of contiguous subintervals that together form a major time interval, minimum and maximum temperatures and corresponding times of occurrence for each said set being stored; means for reviewing the stored minimum and maximum temperatures of



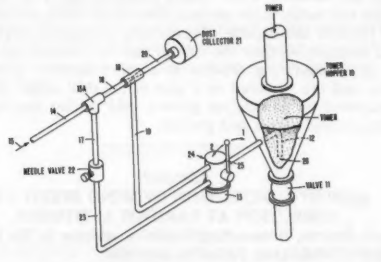
each set of contiguous subintervals to find the greatest and least temperatures recorded during the most recent major time interval terminating at the time of review and the times of occurrence thereof; and means for displaying the most extreme temperatures for said major time interval together with the time of occurrence of each such extreme.

4,286,466

METHOD AND APPARATUS FOR PNEUMATICALLY SAMPLING POWDERS

Ralph J. Stewart, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 9, 1979, Ser. No. 83,067
Int. Cl.[3] G01N *1/14*
U.S. Cl. 73—863.83 **11 Claims**



1. A pneumatic sampler of flowable material operable to cause an amount of such material to flow from a material mass to a sample container, comprising:

a fluid restrictor adapted to be connected to a source of positive-pressure fluid such that fluid flow through said restrictor produces a source of negative-pressure;

first pneumatic circuit means, including a first portion, adapted to connect the source of positive-pressure fluid to the material mass to cause flow in a first direction toward the material mass;

second pneumatic circuit means, including a second portion, adapted to connect the sample container to said source of negative pressure to evacuate the sample container by virtue of flow in a first direction toward said source of negative pressure;

third pneumatic circuit means including only said first and second portions series connected between the sample container and the material mass to cause material flow in a direction opposite said first direction through said first and second portion, from the material mass to the sample container; and

means operable to sequentially effect operation of said first and second pneumatic circuit means, and then operation of said third circuit means.

4,286,467

METHOD OF SELECTING ROLLERS FOR HIGH-SPEED JOURNAL BEARINGS

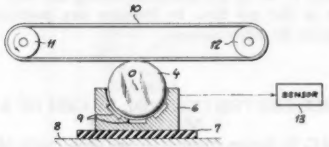
Hans Köber, Schwebheim, Fed. Rep. of Germany, assignor to FAG Kugelfischer Georg Schäfer & Co., Schweinfurt, Fed. Rep. of Germany

Filed Jan. 9, 1980, Ser. No. 110,741

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1979, 2900663

Int. Cl.³ G01M *1/16, 13/04*

U.S. Cl. 73—460 **1 Claim**



1. A method of selecting rollers for assembly into high-speed journal bearings, comprising the steps of:

cradling each roller in a generally semicylindrical cup of an air bearing with a horizontal axis;

resiliently mounting said air bearing on a supporting surface;

frictionally entraining each roller at high speed by a horizontal stretch of an overlying endless belt in tangential contact therewith to set the roller in rotation about a spin axis substantially coinciding with said horizontal axis;

measuring rocking motions of said air bearing due to deviations of said spin axis from said horizontal axis; and

eliminating rollers for which the extent of said rocking motion exceeds a predetermined limit.

4,286,468

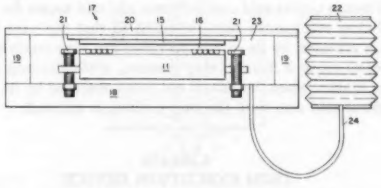
FRUSTRATED TOTAL INTERNAL REFLECTION FIBER-OPTIC SMALL-MOTION SENSOR FOR HYDROPHONE USE

Daniel E. Altman, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 4, 1979, Ser. No. 72,820

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—655 **10 Claims**



1. An apparatus employing a light signal to detect motion comprising:

means forming a base member;

an optical fiber having a core of a given refractive index covered by a cladding, the optical fiber being cemented in a coiled spiral shape on the base member for transmitting light therethrough, the optical fiber having at least a portion of its cladding removed opposite the side that is cemented to the base member to create an exposed evanescent field;

means disposed adjacent to the spiral coiled optical fiber for intercepting at least a portion of the evanescent field when an external stimulus displaces it, the intercepting means having an index of refraction higher than the core to thereby modulate the amplitude of the light signal passing through the spiral coiled optical fiber.

4,286,469

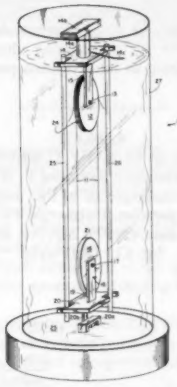
OPTICAL FIBER TEST APPARATUS

John A. Trias, La Mesa, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 6, 1980, Ser. No. 119,058

Int. Cl.³ G01N *3/08*

U.S. Cl. 73—829 **5 Claims**



1. An apparatus for mounting a fiber to determine its tensile strength by a strain gauge in a plurality of environments comprising:

means for providing a rotatable rounded bearing surface being shaped to receive a fiber and being journaled in a fixed support, the rotatable rounded bearing surface providing means is connected to the strain gauge and has a radius of curvature greatly in excess of the fiber's diameter;

means longitudinally aligned with the rotatable rounded bearing surface providing means for defining a fixed rounded bearing surface, the fixed rounded bearing surface defining means has a radius of curvature greatly in excess of the fiber's diameter; and

means disposed on the rotatable rounded bearing surface providing means for adhesively mounting a wrapped length of a fiber to be tested thereon without generating any spurious failure inducing stresses.

4,286,470

CLAMP-ON ULTRASONIC TRANSDUCER

Lawrence C. Lynnworth, Waltham, Mass., assignor to LFE Corporation, Waltham, Mass.

Filed Oct. 19, 1979, Ser. No. 86,330

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—861.18 **6 Claims**

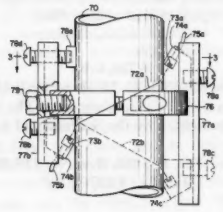
1. An ultrasonic transducer for measuring ultrasonic wave propagation in a medium contained within a generally cylindrical conduit comprising,

a movable clamp having an inner periphery closely fitted to the outer periphery of said conduit in a plane transverse to the axis of said cylinder,

means for securely fastening said clamp to said conduit

thereby defining a plane transverse to said cylinder axis at a fixed point on said axis,

a support member rigidly fixed to said clamp and extending in a direction parallel to said cylinder axis, said support member thereby defining a second plane parallel to said cylinder axis, and



at least one transducer element removably carried on said support member for propagating ultrasonic waves into said conduit along an interrogation path within said medium.

4,286,471

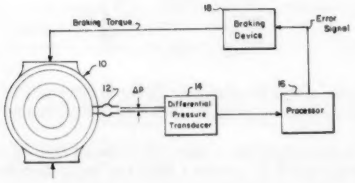
CONSTANT ACCURACY TURBINE METER

Winston F. Z. Lee, Delmont; Raymond V. White, and Felice M. Sciulli, both of Pittsburgh, all of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jun. 4, 1979, Ser. No. 45,533

Int. Cl.³ G01F *1/08*

U.S. Cl. 73—861.84 **15 Claims**



1. A turbine meter comprising a metering rotor having blades oriented to form a blade angle with respect to the axis of rotation of said metering rotor, output means actuated by said metering rotor to provide an output representative of the fluid flow through said metering rotor, a sensing rotor downstream of said metering rotor for sensing the exit angle of the fluid leaving said metering rotor having blades oriented to form a blade angle with respect to the axis of rotation of said sensing rotor, said last mentioned blade angle being substantially less than said first mentioned blade angle, means actuated by said sensing rotor for modifying the output from said metering rotor in accordance with changes in said exit angle.

4,286,472

FLEXIBLE FILTER

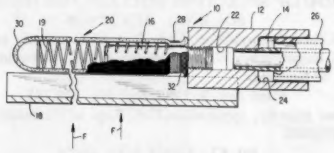
Robert E. Pocock, Highland Heights, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed May 5, 1980, Ser. No. 146,962

Int. Cl.³ G01N *1/22*

U.S. Cl. 73—863.24 **7 Claims**

1. In a gas sampling system for analyzing gases within a duct, including a probe for withdrawing a sample of gas from the duct for analysis: a filter assembly attached to said probe and operable to filter the gas drawn into said probe, said filter assembly comprising a longitudinally extending flexible filter element formed of a temperature resistant ceramic material, support means for maintaining said longitudinal configuration of said filter element and a deflector plate substantially V-shaped and attached to said filter assembly to have the legs of the V of said deflector plate located adjacent the filter element of said filter assembly operable to shield said filter element



from direct impingement of said gas flow and to provide sufficient gas flow along the sides of the filter element of said filter assembly to set up gas currents causing the filter element to flutter in the gas flow to dislodge any particulate matter trapped in the filter element.

4,286,473

DEVICE FOR THE CONTROL BY CAM OF A MOBILE MECHANISM

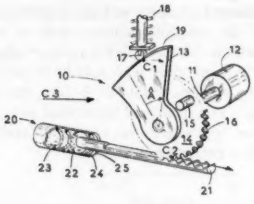
Gerard C. H. Dehan, Montgeron, and Jean-Pierre Maulat, Saint Maur, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Mar. 5, 1979, Ser. No. 17,574

Claims priority, application France, Mar. 3, 1978, 78 06120

Int. Cl.³ F16H *53/00*

U.S. Cl. 74—107 **10 Claims**



1. A device for the control by cam of a mobile mechanism including a motor for effecting the displacement of the cam, a cam follower for the mechanism to be controlled and means to urge said follower against the operating profile of the cam, and further comprising a mobile stop mechanism in the path of movement of said cam, said follower urging the cam toward the stop mechanism, means to urge the stop mechanism toward the cam and means to arrest the stop mechanism in its movement of approach toward the cam to establish a stop position, said means urging said cam follower and said means for urging said stop mechanism being selected so that the cam is able, when actuated by its motor, to move the stop mechanism in order to move it from its stop position, while the stop mechanism is able, when the cam is not being actuated by its motor, to move said cam until the stop position is attained.

4,286,474

TRIM EXECUTION DEVICE

James F. McMahon, Jr., Gates Mills, Ohio, assignor to Cleveland Controls, Incorporated, Cleveland, Ohio

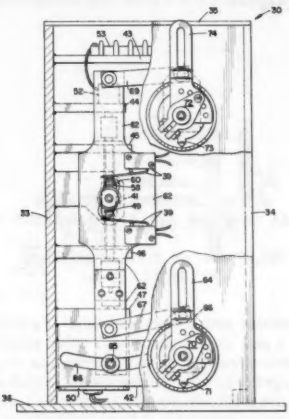
Filed Dec. 19, 1979, Ser. No. 105,226

Int. Cl.³ G05G *1/04*

U.S. Cl. 74—522 **5 Claims**

1. In a control system, primary control means for controlling a controlled element along a range of movement via a mechanical linkage and in response to a primary signal, and trim linkage means for trimming the position of the controlled element

in response to a secondary signal with the degree of trim effected by a given secondary signal input being proportional to the degree of advance of said controlled element along said range of movement, the improvement wherein the trim linkage means comprises a fulcrumed lever movable around a central fulcrum through a range of swinging movement of the lever, means responsive to said secondary signal for moving said fulcrum back and forth from a neutral point along a fulcrum path which is lengthwise of the lever when the lever is at the midpoint of said swinging movement, fulcrum-engaging slide-



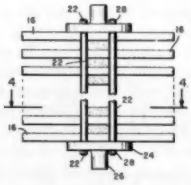
way means on the lever extending in skewed relation to the length of the lever such that at said beginning of said range of swinging movement said fulcrum path and slideway means are parallel but become increasingly skewed as said swinging movement advances through said range, whereby the greater said advance of swinging movement of said lever, the greater the lagging or leading trimming effect, on said advance, of departure of said fulcrum back or forth from said neutral point, and input and output linkages connected to respective ends of said lever.

4,286,475

COMPOSITE MATERIAL FLYWHEEL HUB

Johan A. Friedericy, Palos Verdes Estates, and Dennis A. Towgood, Huntington Beach, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Sep. 26, 1979, Ser. No. 78,981
Int. Cl.³ F16C *15/00*
U.S. Cl. 74—572 **21 Claims**



1. An improved hub for a flywheel having a rim, said hub comprising:

bar means, each being generally flat sided and comprising generally unidirectional filamentary material embedded in a matrix;

a first plurality of said bar means positioned in generally parallel alignment in a first orientation;

a second plurality of said bar means positioned in generally parallel alignment in a second orientation and interdigitated between the bars of said first plurality; and

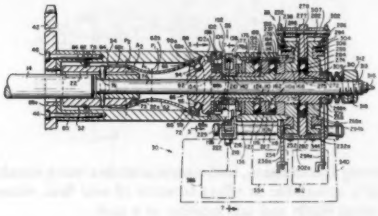
means for securing said first and second pluralities of bar means in a unitary structure with the flat sides of adjacent bar means in engagement and the filamentary material of each of said bar means generally radially aligned.

4,286,476

ROTARY SHAFT CONTROL APPARATUS

Bernard Stiff, 1350 Main St., Lynnfield, Mass. 01940

Filed Dec. 1, 1978, Ser. No. 965,236
Int. Cl.³ F16H *33/04, 15/26, 35/08*
U.S. Cl. 74—640 **19 Claims**



1. Apparatus for controlling the phase or speed of a rotary shaft relative to another element comprising

A. the strain wave drive including

(1) a rigid ring gear,

(2) a first shaft connected to the rigid gear,

(3) a deformable ring gear,

(4) a second shaft connected to the deformable gear,

(5) a strain wave generator engaging the deformable gear, and

(6) means for rotatively mounting the rigid gear and the deformable gear coaxially to one another so that said gears are in toothed engagement around at least parts of their peripheries;

B. means for rotatively coupling the wave generator to the second one of said shafts so that said gears rotate in unison whereby said shafts are effectively rotatively keyed together, and

C. means for dynamically rotating the wave generator through any selected angle in one direction or the other relative to said one shaft at a first rate so as to cause said one shaft to be advanced or retarded in phase relative to the other shaft at a second rate less than the first rate.

4,286,477

STEPLESSLY ADJUSTABLE VARIABLE-SPEED HYDROSTATIC-MECHANICAL COMPOSITE TRANSMISSION

Michael Meyerle, Meckenbeuren; Anton Otto, Tettnang, and Friedrich Ehrlinger, Friedrichshafen-Berg, all of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Fed. Rep. of Germany

Filed Dec. 20, 1978, Ser. No. 971,420
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1977, 2757300
Int. Cl.³ F16H *47/04*
U.S. Cl. 74—687 **9 Claims**

1. A stepless hydrostatic-mechanical composite transmission, comprising:

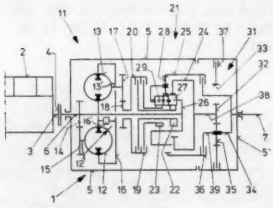
an input shaft and an output shaft connectible respectively to a source of motive power and to a load;

a hydrostatic transmission having two hydraulic machine units connected in a hydraulic circuit and each being provided with a respective shaft, a first of said units being of a variable-displacement type adjustable between a full negative setting and a full positive setting past a zero setting;

a multishaft coaxial summing transmission having a first shaft connected to said input shaft, a second shaft, a third shaft, and gearing connecting said first, second and third shafts;

means connecting a shaft of one of said units to said input shaft, said summing transmission having a pair of output elements;

respective coaxial clutches connecting a shaft of the other of said units selectively to second and third shafts of said



summing transmission, said coaxial clutches being simultaneously actuatable to effect rotation of said first, second and third shafts and said gearing as a unit;

an after transmission having two further input shafts, an output member connected to said output shaft, and gearing connecting said further input shafts with the output member of said after transmission; and

clutch means selectively connecting each of said output elements to a respective one of said further input shafts of said after transmission.

4,286,478

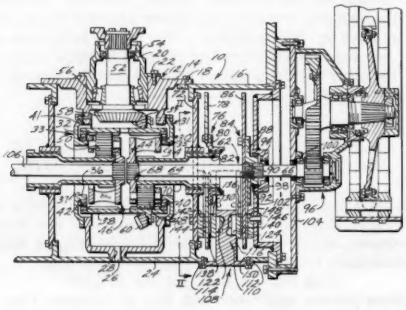
VEHICLE CROSS DRIVE

Orville E. Kessinger, Jr., Blue Grass, Iowa, assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 815,113, Jul. 13, 1977, abandoned. This application Dec. 17, 1979, Ser. No. 104,233

Int. Cl.³ F16H *37/06, 3/44*

U.S. Cl. 74—705 **4 Claims**



1. A vehicle cross drive having a transverse axis, comprising:

a ring gear (**38**);

a pair of planetary gear assemblies (**44,48,46,50**) individually having a carrier (**44,46**) and a plurality of planetary gears (**48,50**) mounted to mesh radially within the ring gear (**38**);

a pair of stationary annular support members (**30,32**) spaced along the transverse axis; and

a pair of bearings (**40,42**) individually carried by the respective support member (**30,32**) radially within the ring gear (**38**) and rotatably supporting the ring gear (**38**), the support members (**30,32**) being of a construction sufficient for limiting transverse axial movement of the carriers (**44,46**).

4,286,479

DRIVE SYSTEM FOR A WORKPIECE TABLE OF A MACHINE TOOL

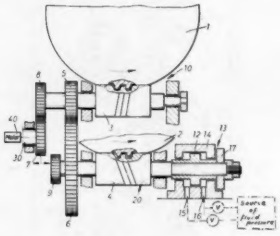
Erich Baumann, Ludwigsburg; Hans-Peter Mente, Hochberg, and Wolfgang Müller, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Hermann Pfauter, Ludwigsburg, Fed. Rep. of Germany

Filed Jun. 12, 1978, Ser. No. 914,494

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1977, 2726469

Int. Cl.³ F16H *37/06*

U.S. Cl. 74—724 **6 Claims**



1. In combination with a workpiece table of a machine tool, especially of a gear cutting machine, a drive system for said workpiece table stressed free and independent of play with stiffness and rigidity at table turning speeds, which includes: a drive shaft drivingly connectable to a motor, two worm wheel drives of different transmission ratio, each of said worm wheel drives comprising a worm and a worm wheel engageable so as to be stressed free of play at lower speeds, the worms of said worm wheel drives being connected to each other and drivingly connectable to said drive shaft while the transmission ratio of said drivingly interconnected worms equals the reciprocal transmission ratio of said worm wheel drives with regard to each other, the worm wheels of said two worm wheel drives being normally coupled to each other and to said workpiece table and being rotatable in the same direction and at equal speed the latter being dependent on the respective coupled worm wheel drive under stress of play-free driving assured at lower speeds of the workpiece table and also avoiding undue heating-up at higher speeds of the workpiece table.

4,286,480

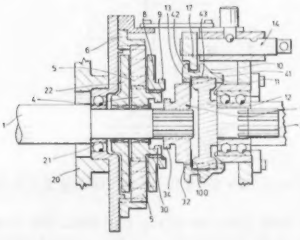
SPEED REDUCER

Ira A. Dickie, Goderich, Canada, assignor to Champion Road Machinery Limited, Goderich, Canada

Filed Sep. 14, 1979, Ser. No. 75,697

Int. Cl.³ F16H *57/10*

U.S. Cl. 74—785 **8 Claims**



1. A speed multiplier or a reducer comprising an input shaft means, an output shaft means, a planetary gear system, and a movable power transfer member adapted to selectively engage

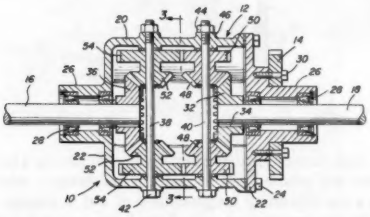
either said input and output shaft means whereby said planetary system may freely rotate, or said output shaft means and said planetary gear system, the arrangement being such that the engagement of said transfer member with said planetary gear system causes the engagement of said input shaft means and planetary gear system thereby changing the speed of said output shaft means relative to said input shaft means, and the engagement of said transfer member with said input shaft means causes the disengagement of said input shaft means and said planetary system, providing a non engaged free planetary system.

4,286,481

POWER TRANSFER DEVICE

Bernard J. Miller, R.D. #1, Box 133, West Alexander, Pa. 15376

Filed Nov. 30, 1979, Ser. No. 99,210
Int. Cl.³ F16H *1/30*
U.S. Cl. 74—799 **2 Claims**



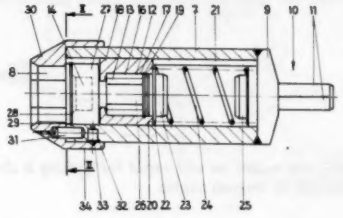
1. A power transfer device comprising a gear box, means on the gear box for driving connection with a power source to rotate the gear box about an axis of rotation, a stationary shaft extending into and rotatably supporting the gear box and defining its axis of rotation, an output shaft extending into the gear box and journaled therefrom for rotation about the same axis as the gear box, said input and output shafts being in axial alignment with the inner ends spaced apart within the gear box, and gear means interposed between the stationary shaft, gear box and output shaft to drive the output shaft at a predetermined ratio with respect to the gear box and neutralize opposing forces within the gear box, said gear means including a stationary bevel gear on the inner end of the stationary shaft and a driven bevel gear on the inner end of the output shaft, a pair of stationary, parallel shafts extending transversely of the gear box in perpendicular intersecting relation to the axis of rotation thereof, a bevel gear and spur gear journaled on each of said parallel shafts, said bevel gear and spur gear on each parallel shaft being rigid with respect to each other, the bevel gear on one of the parallel shafts being meshed with the bevel gear on the stationary shaft, the bevel gear on the other of the parallel shafts being meshed with the bevel gear on the output shaft, said bevel gears on the parallel shafts being laterally spaced from each other and rigid with the spur gear on the same shaft, said bevel gears and spur gears on the parallel shafts being free to rotate on their shafts, said spur gears being meshed with each other and having different rotational speeds, and a second bevel gear and spur gear journaled on each of said parallel shafts in opposed relation to the first bevel gear and spur gear to equalize forces exerted on the components, said second bevel gear and spur gear on each parallel shaft being rigid with respect to each other.

4,286,482

DEVICE FOR POSITIONING ANCHORAGE MEANS

Walter Marsch, Recklinghausen, and Hans Werner, Bottrop, both of Fed. Rep. of Germany, assignors to BWZ Berg-und Industrietechnik GmbH, Bottrop, Fed. Rep. of Germany

Continuation of Ser. No. 899,679, Apr. 24, 1978. This application Dec. 31, 1979, Ser. No. 108,421
Claims priority, application Fed. Rep. of Germany, May 4, 1977, 2719922; Oct. 13, 1977, 2746073
Int. Cl.³ B25B *17/00*
U.S. Cl. 81—55 **12 Claims**



1. A device for fixing of an anchor bolt or the like having at its bolt and projecting out of the bore hole a screw thread for a nut for securing a plate and means for transmission of rotational movement of a tool, the device comprising a rotatable casing which has at one end an opening with a cross-section corresponding to the flat-spacing of the nut for reception of the nut and in which casing is secured non-rotatably an axially slideable bush and a rotation-direction locking ratchet mounted in the bush and movable with the bush axially relative to the casing, the ratchet having an outer part, the outer part being fixed in the bush, and the bush and the casing having complementary external and internal cross section, respectively, to prevent relative rotation thereof and the ratchet having an inner part with a recess adapted for insertion and entrainment of the anchor bolt end, the casing having a base plate at an end opposite the opening and a spring between the base plate and the bush which holds the ratchet urging the bush and the ratchet away from the plate toward the opening.

4,286,483

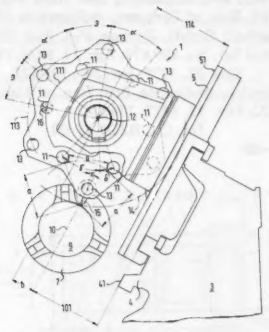
TOOL HOLDING TURRET FOR ROTATING MACHINE

Hasso Henneberg, Hanover; Werner Hesse, Wedemark, and Wilhelm Junike, Hanover, all of Fed. Rep. of Germany, assignors to Gildemeister AG, Bielefeld, Fed. Rep. of Germany

Filed Oct. 17, 1979, Ser. No. 85,604
Claims priority, application European Pat. Off., Aug. 10, 1979, 79102916; Fed. Rep. of Germany, May 25, 1979, 2921284
Int. Cl.³ B23B *29/32*
U.S. Cl. 82—2 R **12 Claims**

1. A turret for processing tools on a turning machine, which is disposed on a cross-slide rest displaceable vertically to a spindle axis of the turning machine on a turning carriage, the latter in turn being displaceable parallel to said spindle axis, comprising: a first set of inner turning tools forming processing tools disposed at equidistant spacings on a circle around an operational axis of the turret, extending parallel or substantially parallel to the spindle axis; a second set of processing tools, at least one of which is an outer turning tool, disposed with their cutting tips outside the circle of said first set so that a tool of one set is always disposed between two tools of the other set, the distances of the cutting tip of one outer turning tool and the two adjacent inner turning tools of the first set being equal or substantially equal to the distance of the tips of the two adjacent inner turning tools, the cutting tip of the tool which at a given time is in its operational position being in a plane extending substantially parallel to the bed of said car-

riage; means for supporting said turret so that its said operational axis is at a greater distance from said carriage than said



spindle axis; and means on said turret for shifting it about its operational axis at unequal angles.

4,286,484

MACHINE TOOL

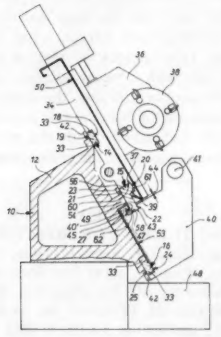
Helmut H. Gatzki, Esslingen, Fed. Rep. of Germany, assignor to Index-Werke KG Hahn & Tessky, Esslingen, Fed. Rep. of Germany

Filed Oct. 5, 1979, Ser. No. 82,309

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1978, 2844247

Int. Cl.³ B23B *17/00*

U.S. Cl. 82—32 **5 Claims**



1. A machine tool comprising a frame, first and second longitudinally extending guides supported on said frame and laterally spaced from one another, a central longitudinally extending guide supported on said frame between said first and second guides and laterally spaced from each of said first and second guides, a first carriage slidably mounted on said first and central guides for movement therealong, and a second carriage slidably mounted on said second and central guides for movement therealong parallel to the direction of movement of said first carriage, said guides having guide faces arranged such that each said carriage is guided both laterally and vertically, wherein the central guide has a first segment on one side thereof, the first segment carrying guide faces arranged to provide complete guidance of the first carriage laterally and vertically, and the central guide has a second segment on the other side thereof, the second segment carrying guide faces arranged to provide complete guidance of the second carriage laterally and vertically, a longitudinally extending holder bar formed on said frame, the central guide being mounted on said holder bar such that said first segment projects laterally of one side of the holder bar and said second segment projects laterally of the other side of the holder bar, each of said central guide segments comprising a salient rail extending in the direction of the length of said central guide for providing said complete guidance of the respective carriages.

4,286,485

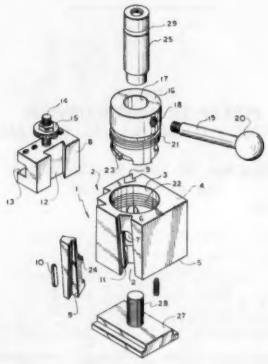
TOOL MOUNTING

Joseph Dezvane, 28 Virginia Ave., Clifton, N.J. 07012, and Vojko Lenac, 19 Putnam Pl., Clifton, N.J. 07011

Filed Feb. 7, 1980, Ser. No. 120,076

Int. Cl.³ B23B *29/26*

U.S. Cl. 82—36 R **4 Claims**



1. A tool mounting, comprising a tool post having a top and a bottom and a bore open at said top and bottom, said post having a slot extending longitudinally of and in angular relation with the longitudinal axis of the bore, said slot opening through a side face of said post and having an inner portion opening into said bore; a slide member arranged in said slot for sliding movement lengthwise of said bore and having an outer wedge-shaped portion provided with a longitudinally extending side face portion, said slide member having an inner part located in said inner portion and provided with a projection which extends into said bore, said post having a longitudinally extending dovetail tongue portion at one side of said slot and with said wedge-shaped portion of said slide member forming a dovetail tongue adapted to receive a tool holder thereon; a tubular hub mounted in said bore for swivel turning movement therein, said hub and said bore having cooperating screwthreads, and said hub also having a helical cam track in which said projection of said slide member is engaged for effecting lengthwise movement of the slide member in said slot and varying the width of said dovetail tongue by turning the hub so as to tighten the tool holder on the dovetail tongue; a handle on said hub for turning the same; a sleeve secured in said bore and about which said hub has swivel turning movement; and means for securing the aforementioned elements of the tool mounting in assembled relation to one another.

4,286,486

FIN COLLECTION AND TRANSPORT APPARATUS

Lawrence A. Franks, Sturgis, Mich., assignor to Burr Oak Tool & Gauge Company, Sturgis, Mich.

Division of Ser. No. 905,022, May 11, 1978, Pat. No. 4,195,540. This application Sep. 24, 1979, Ser. No. 78,363

Int. Cl.³ B65H *35/06;* **B23Q** *7/16;* **B26D** *7/06*

U.S. Cl. 83—23 **2 Claims**

1. A method for forming, collecting and transporting platelike fins, such as apertured fins for heat exchangers, comprising the steps of:

supplying a sheet of thin platelike material to a fin forming apparatus;

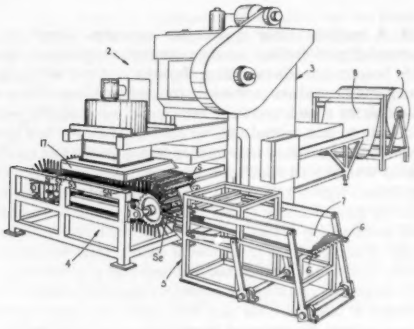
acting on said sheetlike material with said apparatus to simultaneously form, during each cycle, a plurality of similar platelike fins disposed closely adjacent one another in side-by-side relationship;

holding said plurality of formed fins in a row which is elongated in a direction substantially perpendicular to the elongated dimension of the fins, the fins in said row being disposed in adjacent side-by-side relationship;

providing an endless fin collecting and transporting means having a plurality of outwardly projecting fin supports thereon at uniform intervals therealong, which intervals correspond to the centerline-to-centerline spacing between adjacent fins in said row;

positioning said endless device so that a substantially horizontally extending upper reach thereof is disposed below and extends in a direction substantially parallel with said row;

intermittently moving said endless means in an intermittent



steplike manner in synchronism with the cyclic operational rate of said apparatus for causing the upper reach to move stepwise through a predetermined distance along said direction for positioning selected fin supports directly below said row;

releasing said plurality of fins as disposed within said row when said transporting means is stationarily positioned thereunder for causing said plurality of fins to move downwardly and be collected on said endless means by a plurality of said fin supports as disposed adjacent one another;

continuing the intermittent forward advancing of said endless means in synchronization with the forming of fins by said apparatus, and with the release of said fins, so that a stack of fins progressively accumulates at each of said fin supports;

continuing to advance said endless means containing thereon stacks of fins each containing a preselected number until reaching a selected location; and

removing each fin stack from said endless means as each said fin stack is moved into said selected location.

4,286,487

APPARATUS FOR MONITORING THE DELIVERY OF MATERIAL

Laurence P. Rubel, 600 Star St., Ocean Township, Monmouth County, N.J. 07712

Filed Nov. 16, 1979, Ser. No. 94,841
Int. Cl.³ B26D 7/24
U.S. Cl. 83—58 **7 Claims**

1. A monitoring apparatus for monitoring the unwinding of a length of material from a spool means as said material is drawn therefrom comprising:

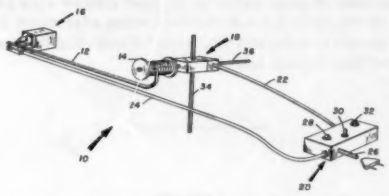
shaft means for accommodating and fixedly securing said spool means thereon;

means for positioning said shaft means at a predetermined location relative to a supporting surface, said positioning means permitting the free rotation of said shaft means about the longitudinal axis thereof;

means for providing a pulsed electrical signal upon rotation of said shaft means, said pulsed electrical signal means having at least one element thereof directly coupled to said shaft means for rotation as a result of the rotation of said shaft means;

means for indicating the output of said electrical signal means;

said indicating means includes a two stage timing means, the



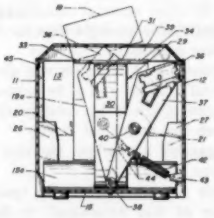
input of the first stage of said timing means being coupled to the output of said pulsed electrical signal means, the output of said first stage of said timing means being coupled to the input of said second stage of said timing means, the output of said first stage of said timing means providing an electrical signal at a first level for a finite interval when said shaft means rotates through a minimum angle, said first stage of said timing means providing at the output thereof an electrical signal at a second level after said finite interval when said shaft means rotates at a speed below a minimum preselected speed or if said shaft means stops, said second stage of said timing means providing a signal at the output thereof if said signal of said first stage at said first level is not received thereby at a preselected interval.

4,286,488

DISPENSING APPARATUS FOR ROLLED SHEET MATERIAL

Joseph E. Mason, Melville, N.Y., assignor to American Can Company, Greenwich, Conn.

Filed Jan. 16, 1980, Ser. No. 112,794
Int. Cl.³ B26D 5/20
U.S. Cl. 83—205 **11 Claims**



1. A dispensing apparatus for a roll package of sheet material, comprising: a container having side and bottom walls, and a cover affording access thereto; means for supporting a roll of sheet material within said container; means defining a slot between adjacent portions of said cover and one of said side walls, through which a free end portion of said sheet material may be fed from said roll; a feeder for said sheet material movable toward and away from said slot, biased toward said roll, and including an upper surface portion disposed for en-

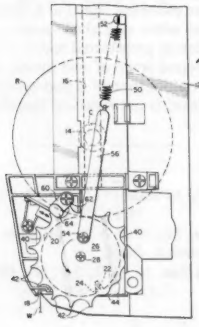
gagement with a lower surface of said sheet material; means defining an opening in said cover in registry with said upper surface portion of said feeder, the construction and arrangement being such that force applied to urge said sheet material against said upper surface of said feeder toward said slot is operative to move said feeder away from said roll toward said slot while feeding said sheet material from said roll through said slot, removal of said force permitting said feeder to move away from said slot, toward said roll; and means on said container for severing the portion of said sheet material fed through said slot, comprising means defining a recessed groove in said cover aligned with and facing the inner edge of said one side wall, and a cutter bar pivotal on said one side wall and including a cutting edge movable between a retracted position below said top edge, and to an extended position upon pivotation of said cutter bar, wherein said cutting edge moves within said groove to sever said sheet material extending transversely thereof and through said slot.

4,286,489

SHEET MATERIAL DISPENSER HANDWHEEL AND CUTTING KNIFE

Raymond F. DeLuca, Stamford, Conn., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Apr. 1, 1980, Ser. No. 136,273
Int. Cl.³ A47K *10/36*
U.S. Cl. 83—335 **7 Claims**



1. A dispenser for sheet material comprising:

a wall mountable chassis having means for supporting a roll of flexible sheet material;

a rotatably mounted feed roller on said chassis to guide a web of material from the roll to be grasped by the user;

cutter mechanism operated by rotation of said roller to divide the web into individual sheets;

a manually engagable handwheel mounted to rotate with said feed roller;

finger engagable notches peripherally spaced around the circumference of said handwheel to facilitate manual forward rotation thereof;

means to prevent reverse rotation of said handwheel through a first circumferential portion of each handwheel revolution; and

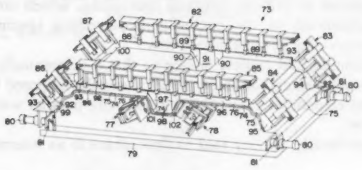
biasing means connected to urge rotation of said feed roller toward a predetermined rotational position and cause reverse rotation through a second circumferential portion of handwheel revolution so as to move said cutter mechanism to a protected location within said dispenser when said handwheel is free from manual restraint.

4,286,490

FORCE APPLICATION APPARATUS

Ernst M. Spengler, Heusenstamm, Fed. Rep. of Germany, assignor to Stanztechnik GmbH R & S, Bergen-Enkheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 965,907, Dec. 4, 1978, abandoned. This application Jan. 17, 1980, Ser. No. 112,937
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1978, 2824488; Feb. 2, 1979, 2903937; Jul. 17, 1979, 2928785; Aug. 25, 1979, 2934441
Int. Cl.³ B26F *1/40*
U.S. Cl. 83—453 **21 Claims**



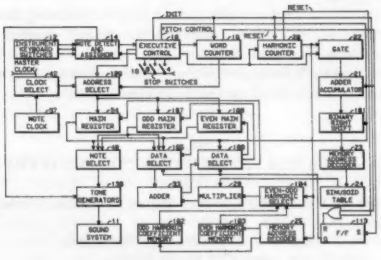
1. A modular force application apparatus, comprising an opensided modular bail having a central axis, pressure expandable hose means (3) extending through said bail substantially along said central axis, a pressure transmission means located in said bail for a back and forth movement substantially perpendicularly to said central axis but restrained by the bail against rotation, said pressure transmission means contacting said hose means whereby said bail takes up a reaction force, guide bushing means rigidly secured to said bail, a guide rod extending into the guide bushing means and rigidly secured to said pressure transmission means for guiding the back and forth movement of said pressure transmission means, reset means operatively interposed between said bail and said pressure transmission means for resetting the pressure transmission means when pressure is released from said hose means and force applying means operatively arranged for movement in the same plane as said guide rod and for cooperation with said pressure transmission means to avoid canting of said pressure transmission means, said bail and said guide means forming a modular unit, whereby a plurality of such bails may be spaced along said expandable hose means.

4,286,491

UNIFIED TONE GENERATION IN A POLYPHONIC TONE SYNTHESIZER

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instruments Mfg. Co., Ltd., Hamamatsu, Japan

Filed Jan. 18, 1980, Ser. No. 113,420
Int. Cl.³ G01H *1/00*
U.S. Cl. 84—1.01 **18 Claims**



1. In a musical instrument in which successive points of a musical waveshape are computed by means of a discrete Fourier transform using a set of harmonic coefficients stored in

numerical order corresponding to the harmonic number of the Fourier transform to form a master data set, apparatus for simultaneously producing a plurality of unified tones at pitches responsive to the setting of a plurality of stop switches comprising;

a means for computing a plurality of master data sets during each of a plurality of computation cycle segments of a sequence of computation cycles wherein a first master data set is computed using the complete stored set of said harmonic coefficients, wherein a second master data set having odd symmetry is computed using the even numbered harmonic coefficients selected from said set of harmonic coefficients, and wherein a third master data set having even symmetry is computed using the odd numbered harmonic coefficients selected from said set of harmonic coefficients,

a first memory means comprising a plurality of master memory means for storing said plurality of master data sets,

a second memory means comprising a plurality of note memory means for storing input data to be thereafter read out,

data transfer means for addressing master data sets out from said plurality of master memory means and for storing said addressed master data sets in said plurality of note memory means in said second memory means,

a means for producing musical waveshapes from master data sets read out of said plurality of note memory means,

a variable frequency clock generator, and

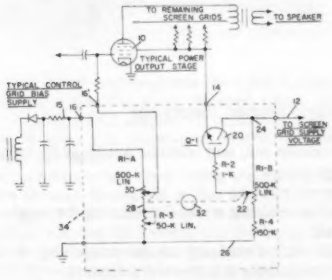
data reconstruction means responsive to said variable frequency clock generator whereby master data sets are read out of said plurality of note memory means in said second memory means and are combined to form a combined data set using combination circuitry responsive to the even symmetry of said third master data set and the odd symmetry of said second master data set and whereby the combined data set is furnished to said means for producing musical waveshapes thereby creating said plurality of unified tones.

4,286,492

CONTROL FOR ELECTRONIC AMPLIFIERS

Guy P. Claret, 211 Main St., Townsend, Mass. 01469

Filed Oct. 2, 1979, Ser. No. 81,097
Int. Cl.[3] G10H *1/02*; H03G *3/02*
U.S. Cl. 84—1.27 **2 Claims**



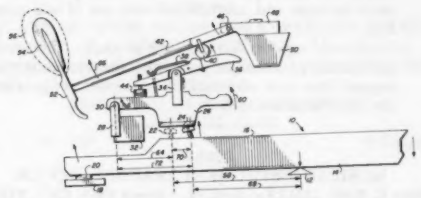
1. In a circuit for an electronic amplifier for musical instruments, the amplifier including an output tube having a control grid and a screen grid and including a bias voltage supply for the control grid and voltage supply for the screen grid, improved means to produce and control distortion in the output tube relative to its input by controlling the clipping point of the tube, the improvement comprising the provision of means for controlling the bias voltage level to the control grid, means for controlling the voltage level to the screen grid, and ganged means simultaneously controlling the voltage supply of the screen grid and the bias voltage supply of the control grid so as to change the voltage applied to said screen and control grids together.

4,286,493

GRADUATED LEVERAGE PIANO ACTION

Keith C. Hardesty, Whittier, Calif., and Gene L. Lukensmeyer, Orlando, Fla., assignors to James R. Wales, Longwood, Fla.

Filed Feb. 7, 1980, Ser. No. 119,489
Int. Cl.[3] G10C *3/18*
U.S. Cl. 84—237 **15 Claims**



1. A graduated leverage piano action for a grand piano having graduated mass hammers for striking graduated mass string wherein the mass of the hammers and strings is highest for the lowest bass strings and lowest for the highest treble strings, comprising:

a. a plurality of keys pivotable about a balance rail which divides each key into first and second lever arms wherein the length of the second lever arms is defined by the location of a capstan screw which is coupled to each key and wherein the length of the second lever arm decreases as the mass of the hammers increases; and

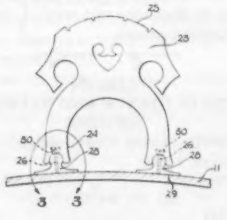
b. means coupled to each hammer and positioned above each capstan screw for displacing a selected hammer when contacted by one of said capstan screws, said displacing means including a third lever arm having a length defined by the point at which said one capstan screw contacts said third lever arm and being displaceable by said one capstan screw, wherein the length of said third lever arm increases as the length of said second lever arm decreases, whereby the force required to displace a piano key remains substantially constant across the piano keyboard.

4,286,494

SELF ADJUSTING BRIDGE WITH LOCKING PIN FOR ALL VIOL INSTRUMENTS

Douglas Jaquith, Yakima, Wash., assignor to Hope Jaquith, Laguna Niguel, Calif.

Filed May 19, 1980, Ser. No. 150,971
Int. Cl.[3] G10D *3/04*
U.S. Cl. 84—309 **6 Claims**



1. In a self-adjusting bridge for a musical instrument of the viol class in which a substantially flat sided and upright standard having a support foot at each end thereof and pivot means connecting each of said support feet to said standard at mating surfaces for the purpose of enabling the lower surface of each

of said support feet to conform to the curvature of the body of said instrument, an improvement comprising:

(a) A pair of slots defined by the lower surface of said standard, each of said slots disposed in the region of said pivot means;

(b) each of said support feet including an aperture extending through said support foot into communication with one of said slots;

(c) a pair of pins, each of said pins extending through one of said apertures into cooperative engagement with one of said slots so as to permit pivoting between said standard and one of said support feet, but restricting lateral movement between said standard and said one of said support feet;

whereby said support feet are each pivotally connected to said standard in a manner preventing the separation of said support feet from said standard by movement parallel to the plane of said standard.

4,286,495

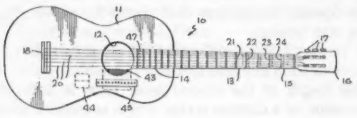
MUSICAL INSTRUMENT TRAINING DEVICE

John K. Roof, 22212 Leadwell St., Canoga Park, Calif. 91303

Filed Sep. 17, 1979, Ser. No. 75,884

Int. Cl.[3] C09B *15/00;* **G10D** *3/06*

U.S. Cl. 84—485 R **6 Claims**



1. A training aid incorporated into the construction of a stringed instrument intended to be finger strummed with one hand and finger depressed strings with the other hand, the combination comprising:

a first group of lights mounted on the fret board of said instrument comprising four transverse rows associated with each of the last four frets respectively;

a second group of lights mounted on the fret board of said instrument comprising a single row of lights immediately adjacent the sounding hole of said instrument;

each of said lights in said first and said second rows lying immediately beneath and in registry with the strings of said instrument;

a diode matrix mounted on said instrument and operably coupled to said first and said second groups of lights whereby selected ones of said lights in said first group display a variety of patterns corresponding to musical chords and whereby selected ones of said lights in said second group display particular strings to be strummed; and

manually operated switch means connected to said diode matrix fo selectively energizing said selected ones of said lights so as to illuminate said musical chord patterns and string strumming pattern.

4,286,496

FASTENER GUIDANCE AND RETENTION TIP MEMBER

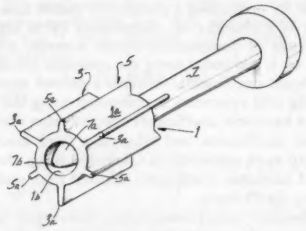
Frederick J. Harris, Clinton, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Oct. 12, 1979, Ser. No. 84,283

Int. Cl.[3] F16B *15/00*

U.S. Cl. 411—441 **10 Claims**

1. In a guidance and retention member for use with a nail-like fastener of the type adapted to be driven by a powder-actuated tool, said member consisting of an axially elongate, hollow, cylindrical body portion, adapted for telescopic retention on at least the forward or nose portion of the fastener, and a plurality of flexible, axially elongate fin members integrally formed on the outer cylindrical surface of said body portion and extending radially thereof at regular circumferential intervals, the improvement comprising: said plurality being an even



integer not less than six, with alternating ones of said fin members being of substantially greater radial extent than the fin members adjacent thereto.

4,286,497

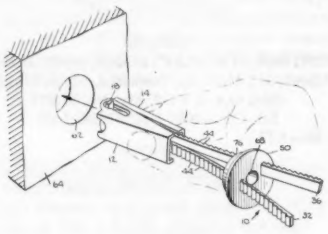
RATCHET-SECURABLE TOGGLE RETAINER

Alfred A. Shamah, P.O. Box 1589, York, Pa. 17405

Filed Jun. 18, 1979, Ser. No. 49,217

Int. Cl.[3] F16B *21/00*

U.S. Cl. 411—342 **4 Claims**



1. A toggle fastener, comprising:

(a) toggle wings,

(b) a trunnion nut, said trunnion nut hingedly securing said toggle wings,

(c) a screw element,

(d) ratchet-retaining means for securing the toggle wings to a wall,

(e) said ratchet-retaining means comprising at least one ratchet-securing member and a retainer,

(f) said ratchet-securing member extending between the trunnion nut and a wall-hole and engaging said trunnion nut to orient said trunnion nut with respect to the wall-hole,

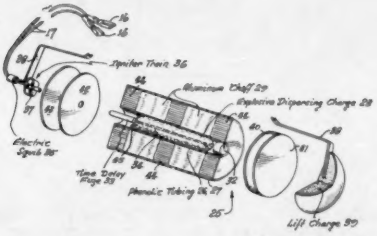
(g) said retainer being adjustably securable to said ratchet-securing member on the opposite side of the wall-hole from said toggle wings,

(h) whereby said toggle wings are secured to the wall by said ratchet-securing member and said retainer, and the trunnion nut is axially aligned with the wall-hole by said ratchet-securing member for engagement with the screw element.

4,286,498
DECOY ROUNDS AND THEIR METHOD OF FABRICATION

Kenneth A. Block, Claremont; William M. Carter, and George H. Schillreff, both of Glendora, all of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Filed Dec. 21, 1965, Ser. No. 515,493
Int. Cl.³ F42B *33/10*
U.S. Cl. 86—1 R **9 Claims**

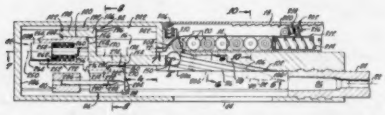


1. A method for producing a line type burst charge adapted for dispersing energy generating material in an effective pattern for confusing energy sensing devices comprising the steps of: screening potassium perchlorate through about a number twenty screen; mixing the screened potassium perchlorate with black aluminum in the ratio of about five parts by weight of potassium perchlorate to about two parts by weight of black aluminum; screening the mixture a predetermined number of times through about a number twenty screen, containing the mixture, and positioning a fusing member therein.

4,286,499
CROSS AXIS SHELL FEEDING APPARATUS FOR FIREARMS

Richard R. Gillum, 1002 Lake St., Marblehead, Ohio 43440

Filed Oct. 24, 1979, Ser. No. 87,786
Int. Cl.³ F41D *10/20*
U.S. Cl. 89—33 B **9 Claims**



1. Cross axis shell feed apparatus for a gun having a barrel with a rearwardly opening firing chamber; which comprises:

(a) shell supply means adapted for containing a plurality of shells in cross axis orientation relative to a bore axis through the barrel;

(b) shell pivoting means for pivoting shells from the supply means through 90 degrees so that longitudinal shell axes are coplanar with said barrel bore axis and the shells are correctly pointing for loading into the firing chamber,

said shell pivoting means having means defining a shell infeed opening positioned to receive shells from the shell supply means and defining a shell outfeed opening at 90 degrees thereto, and having internal camming means for causing 90 degree shell pivoting as a shell is moved from said infeed opening to said outfeed opening;

(c) shell ramming means for pushing shells, one at a time, through said shell pivoting means to thereby cause the 90 degree shell pivoting,

said ramming means including a first stage rammer configured for engaging and pushing shells partially through the shell pivoting means to cause partial 90° shell pivoting, disengaging means for then enabling disengagement of the first stage rammer from the shell, and a second stage rammer configured for then engaging the shells to cause completion of 90° shell pivoting and pushing of the shells on through said shell pivoting means;

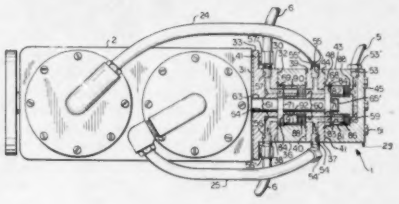
(d) means for axially moving said ramming means, in synchronization with firing of the gun, in a reciprocating manner for enabling a sequence of shells to be pushed through the shell rotating means and pivoted 90° for feeding from the shell supply means to the firing chamber; and

(e) means for moving shells from said outfeed aperture into said firing chamber for firing.

4,286,500
ROTARY CONTROL VALVE FOR EXPANSION FLUID DRIVEN ENGINES

Robert L. Stevenson, Overland Park, Kans., assignor to Havaco Incorporated, Overland Park, Kans.

Filed Aug. 17, 1979, Ser. No. 67,460
Int. Cl.³ F01L *33/02*
U.S. Cl. 91—180 **8 Claims**



1. A rotary valve for an expansion fluid driven engine having a cylinder and a piston reciprocably mounted therein, said valve comprising:

(a) a body having a first end portion mounted to said engine, an intermediate portion and a second end portion;

(b) said body having a fluid inlet port at said second end portion, a distribution port at said intermediate portion for communicating with said cylinder, and a fluid outlet port at said first end portion;

(c) a drive shaft extending into said body and rotatably mounted therein;

(d) first and second disc members positioned within said body and mounted on said drive shaft for rotation therewith, said disc members each having a peripheral rim surface and opposite face surfaces;

(1) said first disc member having a pressure fluid passage extending therethrough and between said opposite face surface and alternately communicating said inlet port with said distribution port;

(2) said second disc member having an exhaust fluid passage extending therethrough and between said opposite face surfaces and alternately communicating said distribution port with said outlet port;

(e) means rotating said drive shaft and said first and second disc members thereon in synchronization with reciprocation of the engine piston;

(f) first and second piston members respectively having passages therethrough and sealing faces and positioned within said body against respective portions of said face surfaces of said first and second disc members; and

(g) spring members in said body urging said piston members against said disc members with said sealing faces and said portions of said face surfaces in sealing engagement, the passage of the first piston member providing communication between said inlet port and said distribution port with portions of said first disc member posed therebetween and rotatable to alternately close and open and route fluid to said cylinder, the passage of the second piston member providing communication between said distribution port

and said outlet port with portions of said second disc member posed therebetween and rotatable to alternately close and open and route fluid from said cylinder.

4,286,501

SERVO BOOSTERS FOR VEHICLE BRAKING SYSTEMS

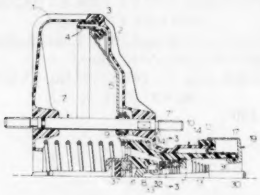
Alfred W. Thomas, Koblenz, and Lutz E. A. op den Camp, Koblenz-Moselweiss, both of Fed. Rep. of Germany, assignors to Lucas Industries Limited, Birmingham, England

Filed Jul. 6, 1979, Ser. No. 55,484

Claims priority, application United Kingdom, Jul. 8, 1978, 29266/78

Int. Cl.³ F15B *9/10*; F16J *15/18*

U.S. Cl. 91—376 R **4 Claims**



1. A servo booster assembly for a vehicle braking system comprising a housing, a pedal-operated input member, an output member, a movable wall for augmenting the force applied by said input member to said output member, said movable wall dividing the interior of said housing into two chambers, valve means controlling the differential pressure of said chambers, a hollow valve body of said valve means, means connecting said valve body to said movable wall, a guide means located in the rear of said housing, a bore wall of said guide means defining a bore of non-round cross-section, a part of said valve body extending through said guide means, and said valve body, when viewed in cross-section on a plane which is perpendicular to the axis of said bore, comprising a radially inner surface of circular shape and a radially outer surface of non-round shape in non-rotatably sliding contact with said bore wall in said housing whereby said valve body is prevented from turning relative to said housing about said axis, said radially inner and outer surfaces of said valve body defining between them a radially thickened portion of said valve body, and a fluid conduit provided in said radially thickened portion and communicating with one of said chambers.

4,286,502

HYDRAULIC LOAD LIFTING SYSTEM WITH AUTOMATIC BLOCKING VALVE

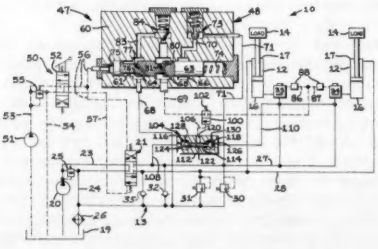
Donald L. Bianchetta, Coal City, and Edward A. Wirtz, Joliet, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/79/00859, § 371 Date Oct. 15, 1979, § 102(e) Date Oct. 15, 1979, PCT Pub. No. WO81/01034, Pub. Date Apr. 16, 1981.

This PCT application filed Oct. 15, 1979. Ser. No. 118,037

Int. Cl.³ F15B *13/042*

U.S. Cl. 91—445 **7 Claims**



1. In a hydraulic system (10) having a cylinder (12), a check valve means (33) for selectively checking hydraulic fluid flow in a main line (27) to the cylinder (12), wherein hydraulic pressure from said cylinder (12) acts behind said check valve means (33) to close said check valve means (33), and a vent line means (69) for selectively venting behind said check valve means (33) to allow said check valve means (33) to open, the improvement comprising a pressure responsive blocker means (100,104) for closing said vent line means (69) when the pressure in said main line (27) falls below a predetermined level.

4,286,503

MACHINE OF THE AXIAL PISTON PUMP TYPE WHICH CAN BE USED AS A PUMP OR AS A MOTOR

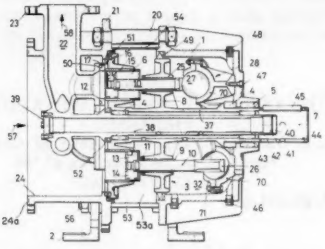
Stefan Fule, Schwalheimer Strasse 23, D-6350 Bad Nauheim, Fed. Rep. of Germany

Filed Mar. 23, 1978, Ser. No. 889,363

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1977, 2713009

Int. Cl.³ F01B *13/04*

U.S. Cl. 91—507 **17 Claims**

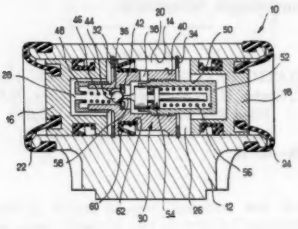


1. In a machine of the axial piston pump type which can be selectively used as a pump or as motor for a fluid medium, which comprises a cylinder drum which is mounted rotatably in a casing and in which working pistons are axially displaceable in working cylinders in axial bores distributed over the periphery of the cylinder drum, wherein piston rods are connected to the working pistons and have ends that run on a control cam which is fastened to the casing, said cam is concentric to a central shaft and extends undulatingly in the axial direction so that a rotary movement in the cylinder drum is converted into a reciprocating movement of the working pistons, or vice versa, and wherein at least one suction opening and one pressure opening are provided which are fixed to the casing and which communicate with said working cylinders, the improvement wherein said casing terminates in a tubular duct coaxial therewith that defines one of said openings and is of a diameter generally about the same as that of said drum to provide for the direct flow of said fluid medium to said working cylinders without undergoing a change in the direction of flow, said tubular duct terminating in a first connecting flange of a diameter generally about the same as that of said drum, and a second duct defines the other of said openings and terminates in a second connecting flange and extends to the side of said tubular duct, said first and second ducts are formed by a common fixed means which forms the inlet and outlet for a rotary barrel pump or motor, and said second duct is located in a radial side of said tubular duct.

4,286,504
DRUM BRAKE ACTUATING DEVICE

Jean-Jacques Carre, Montreuil, and Roland Levrai, Stains, both of France, assignors to Societe Anonyme D.B.A., Drancy, France

Filed Oct. 4, 1979, Ser. No. 81,720
Int. Cl.³ F15B *11/00*
U.S. Cl. 91—517 **3 Claims**



1. A wheel cylinder for effecting the application of a drum brake, said wheel cylinder comprising:

a housing defining a bore therethrough adapted to receive pressurized fluid from a source of fluid pressure;

a pair of pressure responsive pistons reciprocably received in said bore and sealingly cooperating with said housing to define a pressure chamber;

a core member received in said chamber and dividing said pressure chamber into a pair of compartments, one of said compartments having continuous fluid communication with said source of fluid pressure, said core member including passage means for providing fluid communication between said one compartment and the other compartment;

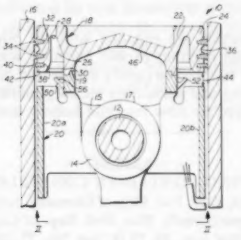
pressure responsive valve means disposed in said passage means for controlling the flow of pressurized fluid through said passage means as a function of the fluid pressures in said pair of compartments, said pressure responsive valve means including control means for holding said valve means open when the pressure in said one compartment is less than a first predetermined pressure, for closing said valve means when the pressure in said one compartment is greater than said first predetermined pressure and less than a second predetermined pressure, and for opening and closing said valve means to maintain a constant pressure difference between said pair of compartments in response to increasing pressure in said one compartment when the pressure in said one compartment is greater than said second predetermined pressure;

said pressure responsive valve means including an annular valve seat and a pressure responsive valve member in a first position spaced from said valve seat, said valve member being disposed down stream of said valve seat relative to fluid flow toward said other compartment, said valve member in a second position being engageable with said valve seat to close fluid communication through said passage means, first resilient means for urging said valve member toward said second position, said core member defining a bore intersecting said passage means upstream of said valve seat, said bore receiving a cylinder member, said control means including a pressure responsive member, said pressure responsive member including a lug extending through said annular valve seat and engageable with said valve member, second resilient means disposed in said cylinder member for urging said pressure responsive member to a first position in which said lug urges said valve member to the first position thereof to open said valve means, said pressure responsive member moving to a second position retracting said lug into said annular valve seat in response to said first predetermined pressure in said one compartment so that said valve member is engageable with said valve seat to close said valve means, said valve member disengaging from said valve seat responsive to a predetermined pressure difference thereacross to communicate increasing fluid pressure to said other compartment.

4,286,505
OIL COOLED PISTON

John K. Amdall, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US79/00259, § 371 Date Apr. 23, 1979, 102(e) Date Apr. 23, 1979, PCT Pub. No. WO80/02308, PCT Pub. Date Oct. 30, 1980.
This PCT application filed Apr. 23, 1979, Ser. No. 85,644
Int. Cl.³ F01P *3/08*
U.S. Cl. 92—186 **4 Claims**



1. An oil cooled piston (**10**) comprising:

a crown portion (**18**);

inner (**22**) and outer (**24**) annular walls connected to said crown portion (**18**) defining an annular groove (**26**) including an annular opening (**30**), said outer wall (**24**) having an end surface (**42**) adjacent said opening (**30**);

means for trapping fluid and for directing trapped fluid into said annular groove (**26**) in response to reciprocating motion of said piston, said means being a substantially annular ledge (**50**) extending solely from said inner wall (**22**) and directed toward said outer wall (**24**) terminating at a lip (**52**) spaced from said end surface (**42**) and having a sloping surface (**56**) extending from said inner wall (**22**) to said lip (**52**), said sloping surface (**56**) being angularly disposed with the inner wall (**22**);

means (**60**) for permitting a pressurized stream of fluid to be directed past said ledge (**50**) to said annular groove (**26**), said means for permitting said fluid to be directed past said ledge (**50**) comprising at least one axially directed slot (**60**) formed throughout the outermost edge of said lip **52**.

4,286,506
AIR VENTILATION APPARATUS FOR VEHICLE

Toshio Yanagida, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama City, Japan

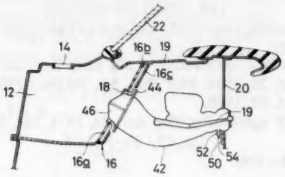
Filed Nov. 24, 1978, Ser. No. 963,646
Claims priority, application Japan, Mar. 29, 1978, 53/39348[U]
Int. Cl.³ B60H *1/00*
U.S. Cl. 98—2 **7 Claims**

1. An air ventilation apparatus mounted in a vehicle having a partition wall and an instrument panel which are spaced from each other to define therebetween a considerable space, said partition wall being formed with an opening which is communicable with the open air surrounding said vehicle, said ventilation appartaus comprising:

a hollow body having a first open end attached to said partition wall to open to said opening of the same and a second open end supported by said instrument panel; and

means for locating said first open end of said hollow body with respect to said opening of said partition wall while permitting the open air to flow into said hollow body, said locating and permitting means comprising at least two intersecting tapered vanes which are integrally mounted

on the mouth of said first open end of said hollow body and combine to form an arrow head-like configuration with the apex thereof projecting longitudinally outwardly from said mouth, each of said tapered vanes including means defining portions near its base section, inflection



portions which are engaged with the boundary surface defining the opening of said partition wall to allow the combined vanes to be tightly held in said opening wherein said locating and permitting means permits a substantially unobstructed air flow into said hollow body.

4,286,507

SHIPPING CONTAINER CONSTRUCTION

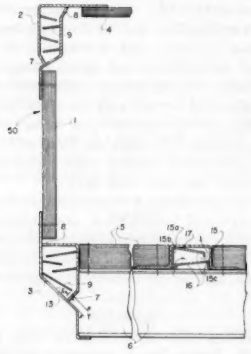
Willi Dörpmund, Elze, Fed. Rep. of Germany, assignor to Graaff Kommanditgesellschaft, Elze, Fed. Rep. of Germany

Filed Sep. 20, 1979, Ser. No. 77,200

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1978, 2648666

Int. Cl.[3] **B65J** *1/02;* **F24F** *13/00*

U.S. Cl. 98—32 **1 Claim**



1. An improved ventilation arrangement in the bottom wall of a shipping container of the type having top, bottom and side walls, at least one side of said container having upper and lower longitudinally extending hollow tubular chords adjacent the top and bottom of the side wall each having top and bottom openings, a plurality of downwardly inclined and oppositely directed deflectors within each of said upper and lower chords disposed between the openings of respective ones of the chords, the bottom wall connected to the lower chord having a cross-beam, and the bottom opening of the lower chord being directed toward the cross-beam and the top opening of the lower chord being directed toward the interior of the container to establish fluid communication therewith, the improvement comprising, in combination therewith, a continuous U-shaped longitudinally extending beam portion located intermediate the length of the bottom wall, said beam portion opening downwardly toward the cross-beam and having a top with at least one aperture extending therethrough to establish fluid communication between the interior of the container and the cross-beam, said beam portion having first and second spaced apart beam side walls connected to the bottom wall of the container, and one baffle in said beam portion on one of said beam side walls sloping downwardly toward the opposite beam side wall but spaced at its outer end from said opposite beam side wall to allow fluid communication around said one baffle, another baffle extending from said opposite beam side wall towards the first mentioned beam side wall and being adjacent the beam portion opening and arranged to also allow fluid communication therearound.

4,286,508

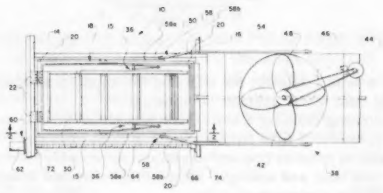
COMBINATION STAIRCASE AND ATTIC FAN MEANS

Thomas C. Seebo, II, 1641 Kildonan Pl., Cary, N.C. 27511

Filed Sep. 8, 1980, Ser. No. 185,019

Int. Cl.[3] **F24F** *7/00;* **E04F** *11/06*

U.S. Cl. 98—43 R **8 Claims**



1. A combination staircase-attic fan assembly adapted to be utilized in conjunction with an attic opening formed within a structure wherein in one mode the attic fan assumes a position in said attic opening and is operative to exhaust air from the attic portion of the structure and in a second mode the staircase is operative to assume a position in said attic opening for providing access to the attic, said combination staircase-attic fan assembly comprising: a staircase assembly; mounting means for movably mounting said staircase assembly about said attic opening for movement between a first operative position within said attic opening wherein the staircase may be lowered for access to said attic, and a second position where said staircase is located remotely from said first operative position; a fan assembly having means for movably mounting the same about said attic opening for movement between a first operative position within said attic opening wherein when actuated said fan assembly is operative to induce air from portions of said structure below said attic, through the attic opening, and on through the attic where the air is exhausted therefrom, and a second position remotely located from said first operative position of said fan assembly; coupling means operatively interconnected between said staircase assembly and said fan assembly for moving the two in unison such that movement of said staircase assembly from said second position to said first operative position results in said fan assembly being moved from its first operative position to its second position and vice versa; and drive means operatively associated with said staircase-fan assembly for driving the staircase assembly and fan assembly between their respective positions.

4,286,509

TOASTING APPARATUS

Dye O. Miller, South Barrington; August J. Antunes, Elmhurst, and Jerome Antunes, Clarendon Hills, all of Ill., assignors to A. J. Antunes & Co., Addison, Ill.

Filed Aug. 28, 1979, Ser. No. 70,483

Int. Cl.[3] **A47J** *27/62*

U.S. Cl. 99—332 **16 Claims**

1. A toasting apparatus comprising

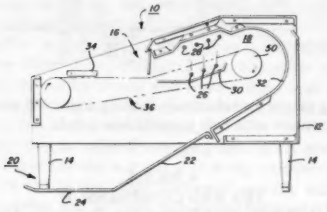
a housing defining a toasting chamber,

a first opening defined in said housing for the introduction of a product into said toasting chamber,

a second opening defined in said housing for the removal of said product after toasting,

means for conveying said product from said first opening to said second opening,

first heating means in said chamber, said first heating means being continuously energized,



second heating means in said chamber, and first switch means mounted adjacent said conveying means so as to be engaged by said product to energize said second heating means for a predetermined period of time.

4,286,510

DEVICE FOR INJECTING A TREATING LIQUID INTO MATERIAL TO BE TREATED

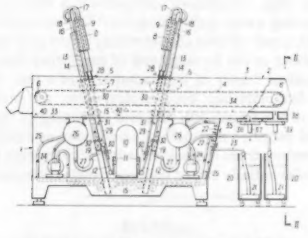
Otto Prosenbauer, Vienna, Austria, assignor to Prosenbauer & Co. Maschinenhandel, Vienna, Austria

Filed Dec. 31, 1979, Ser. No. 108,598

Claims priority, application Austria, Jan. 9, 1979, 156/79

Int. Cl.³ A23L *3/34;* A23B *4/00*

U.S. Cl. 99—533 **5 Claims**



1. A machine for injecting a treating liquid into an edible material for the treatment thereof, comprising a frame, conveyor means extending longitudinally of said frame and defining a support surface for said edible material, at least two needle cases spaced from each other and mounted on said frame and being movable in guided relation in an upward and downward direction with respect to said support surface, motor means mounted on said frame and being interconnected to said needle cases for effecting the movement thereof, an injection needle set resiliently mounted on each of said needle cases for movement therewith and being movable into penetrating relation with the edible material as said edible material is transported transversely with respect to the path of said needle cases by said conveyor means, a separate treating liquid supply system associated with each of said needle sets, each of said treating liquid supply systems including a separate treating liquid storage tank that is located adjacent to the bottom of the frame, a conduit extending from each storage tank to the respective needle set for conducting treating liquid thereto, a separate pump interconnected in each treating liquid supply system for directing the treating liquid from the respective storage tank to the needle set thereof, and a separate liquid circuit for each liquid supply system for recycling the treating liquid that is ejected from said needle sets but that fails to be injected into said edible material, each of said circuits including a collecting means for receiving the unused treating liquid that fails to be injected into said edible material and a return conduit communicating with the collecting means and the storage tank of the associated liquid sypply system, the collecting means for said circuits including a vat that is mounted on said frame in surrounding relation with respect to said conveying means, said vat including spaced side walls, end walls and a pair of horizontal and parallel bottom walls that are located in spaced vertical relation between said side walls, the lowermost of said bottom walls extending for the length of said vat, the uppermost of said bottom walls being foreshortened with respect to the lowermost bottom wall and the forwardmost end of said uppermost bottom wall being located between said needle sets, wherein only one of said needle sets directly overlies one of said bottom walls, said bottom walls defining an interspace therebetween that forms a channel that communicates with one of said return conduits, said one return conduit directing unused liquid collected by said lowermost bottom wall to the storage tank in circuit therewith, the other of said return conduits communicating with said uppermost bottom wall for directing unused liquid collected by said uppermost bottom wall to the storage tank in circuit therewith.

4,286,511

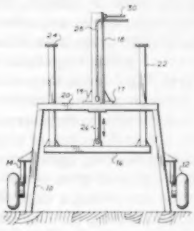
PACKER LATCH FOR MODULE BUILDER

Don R. Johnson, Wolfforth, Tex., assignor to Harris & Thrush Manufacturing Company, Wolfforth, Tex.

Filed Jun. 19, 1980, Ser. No. 161,126

Int. Cl.³ B30B *13/00*

U.S. Cl. 100—35 **4 Claims**



3. The process involving a cotton module builder having

a. side walls,

b. a carriage extending from one side wall to the other,

c. a tramper with a foot mounted for vertical reciprocation to the carriage,

d. a hydraulic cylinder having a lower end on the carriage and having

e. a reciprocating ram telescoped within cylinder and attached to the tramper foot;

wherein the improved method comprises:

f. latching the cylinder in the raised position by

g. holding hooks on the cylinder with bails,

h. raising the bails to a raised position to latch the cylinder in the raised position, and

i. releasing the bails by

j. relaxing the strain upon the bails by

k. lowering the foot to the full lowered position, and

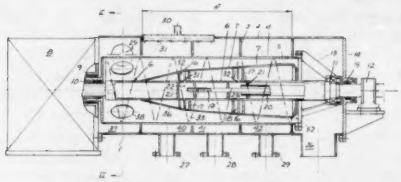
l. forcing the cylinder up with hydraulic pressure therein and

m. lowering the bails downward and free of the hooks.

4,286,512
SCREW-PRESS

Torsten L. Berggren, Rosenlidsgatan 13, S-571 00 Nässjö, Sweden

Filed Jun. 6, 1979, Ser. No. 45,951
Claims priority, application Sweden, Jun. 14, 1978, 7806848
Int. Cl.³ B30B *9/12*
U.S. Cl. 100—74 **7 Claims**



1. A screw-press for pressing liquid from fibrous slurries, such as paper pulp, sludge, sedimentation and like material, comprising:

a cylindrical perforated strainer drum;

a press screw arranged within said cylindrical strainer drum with a space therebetween and being rotatable about its longitudinal axis, said material being fed into the press at one end of said press screw and being fed out of the press through a discharge zone located at the other end of said press screw;

said press screw having a core with an outer wall which has a successively increasing diameter along the major part of its length such that a space defined between said core and the wall of said strainer drum gradually decreases in the feed direction of the material;

said strainer drum being rotatable about said longitudinal axis, at least one of the speed of rotation of said strainer drum and the direction of rotation of said strainer drum differing from the speed of rotation and the direction of rotation of said press screw, and wherein the speed of rotation of the strainer drum is so selected to produce a centrifugal force of given magnitude such that as the result of said centrifugal force, there is obtained an effective draining through said perforations of said strainer drum of free liquid present in the slurry and liquid pressed from said slurry due to the action of said press screw; and

means for introducing washing liquid into at least a portion of the space between said press screw and said strainer drum, said portion comprising a stage of said screw press, for the purpose of washing the material introduced into said press, said means for introducing washing liquid including distribution channels in said core for the washing liquid, and peripheral slots in the outer wall of said core, said distribution channels discharging into said peripheral slots, said washing liquid being drained off together with other free liquid present in the slurry through said perforations of said strainer drum.

4,286,513
TAGGING APPARATUS FOR HAY BALER

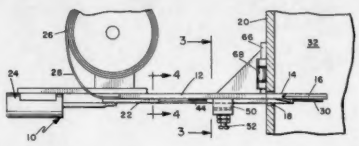
Don Floyd, 4658 El Penon Way, San Diego, Calif. 92117; Lee M. Whittle, 396 W. Keystone Rd., Brawley, Calif. 92227, and Richard R. Ramey, 1409 Farneworth Rd., El Centro, Calif. 92243

Filed Jul. 24, 1980, Ser. No. 172,001
Int. Cl.³ B30B *15/00*
U.S. Cl. 100—102 **10 Claims**

1. A tagging attachment for a baler having a chamber through which materials are formed into a bale, the attachment comprising:

a support member for projecting through the wall of a baler into the baler chamber and having substantially planar support surface parallel to the direction of movement of the bale through the chamber;

guide means for guiding a tag onto said support surface; and

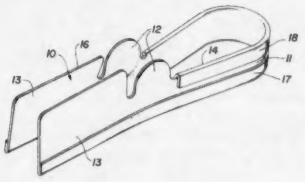


feeding means for selectively feeding tags onto said surface for passage with bale material into a bale.

4,286,514
TEA BAG COMPRESSOR

Reginald D. Wilson, 2601 Roslyn Ave., Baltimore, Md. 21216

Filed Aug. 27, 1980, Ser. No. 181,873
Int. Cl.³ B30B *5/02*
U.S. Cl. 100—211 **4 Claims**

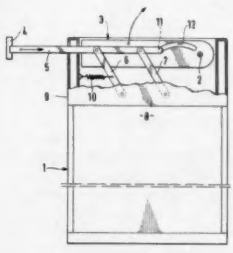


1. A tea bag compressor comprising a one-piece spring member having a rear spring loop sized for convenient holding in one hand, a pair of laterally opposing finger grip tabs on said spring member at the forward end of the spring loop and near the longitudinal center of said member, and a pair of laterally opposing flat plate-like compression jaws on said member forwardly of the finger grip tabs and extending to the forward end of said member and being convergent upwardly in two planes extending from the bottom edge of the spring loop to an elevation substantially above the upper edge of the spring loop.

4,286,515
COMPACTING WASTE BASKET

Manfred Baumann, Diepoldsau, Switzerland, and Wolfgang Lohmann, Wiesbaden, Fed. Rep. of Germany, assignors to Apura GmbH & Co., Mainz-Kostheim, Fed. Rep. of Germany

Filed Nov. 21, 1979, Ser. No. 96,271
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1978, 2850959
Int. Cl.³ B30B *15/06*
U.S. Cl. 100—233 **2 Claims**



1. A container for waste paper or the like, comprising:

(a) waste compacting means in the form of a pivotally mounted lid which fits into said container and occupies a volume in said container large enough to accommodate individual waste pieces to be deposited and compacted in said container,

(b) means for retaining said lid in the closed position,

(c) a transversely extending and horizontally movable bar (4) located on a front side of the container (1) and operated by a clothed part of the body,

(d) a pair of horizontal bars (5) individually disposed on opposite sides of the container, each horizontal bar extending outwardly at one end from a front wall of the container (9), and each horizontal bar being connected at said one end to said movable bar,

(e) at least one articulated swinging arm (6, 7) pivotably connected at one end to a side wall of the container and at the other end to one of the horizontal bars (5), and

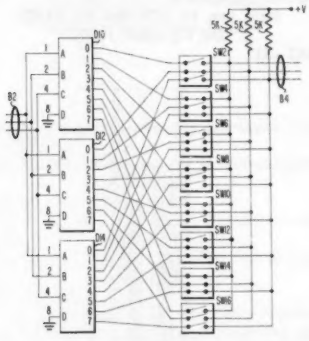
(f) means connecting the other ends of said horizontal bars to said lid.

4,286,516

ELECTRONIC CONTROL FOR TIMING HAMMERS IN IMPACT PRINTERS

Harry Wertanen, Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 15, 1979, Ser. No. 84,817
Int. Cl.³ B41J *7/92*
U.S. Cl. 101—93.03 **6 Claims**



1. In a system for electronically adjusting the spacing between columns of print on a high speed printer in which the print is produced on a moving surface by operation of an assembly of hammers, each hammer being driven by associated magnetic actuating means in response to high energy pulses:

a multiplexer responsive to selected input pulses for providing firing pulses for energizing the magnetic actuating means and driving selected print hammers;

counter means providing a first group of pulses to said multiplexer to successively enable each of a plurality of input terminals of the multiplexer;

an alterable read only memory providing a second group of pulses to said multiplexer to energize selected inputs of the multiplexer in a manner to determine when printing will occur;

a source of strobe pulses designating columns in which data is to be printed; and

means for applying said strobe pulses to said multiplexer to energize a strobe input of the multiplexer;

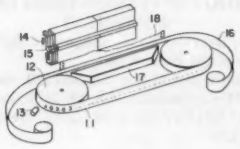
whereby said multiplexer is energized to provide firing pulses to operate selected print hammers when pulses from said first and second groups of pulses coincide with the occurence of strobe pulses at the multiplexer.

4,286,517

PRINTER MAGNETIC INTERFERENCE PREVENTION SYSTEM

Shigenobu Katagiri; Hiroshige Nakano, and Kazuo Matsuzaki, all of Katsuta, Japan, assignors to Hitachi Koki Company Limited, Tokyo, Japan

Filed Jul. 12, 1979, Ser. No. 57,148
Int. Cl.³ B41J *1/20*
U.S. Cl. 101—93.14 **7 Claims**



5. A magnetic interference prevention system in a printer, said printer comprising a plurality of print hammers having their respective hammering surfaces disposed in a straight line, a plurality of printing magnets arranged adjacent one another to drive respective print hammers and means for energizing said print hammers in response to actuating signals, said printer further comprising signal generating means for generating a first scanning signal, first signals sequentially specifying said print hammers, second signals representing particular hammers which are permitted to be energized and which are displaced in time with respect to said first signals, and signals indicative of confrontation of printing type with a print hammer, said magnetic interference prevention system comprising:

a first flip-flop having set and reset inputs, an output and an inverted output;

a second flip-flop having set and reset inputs and an output;

a first AND gate receiving as inputs said second flip-flop output and said signal indicative of confrontation of printing type with a print hammer, the output of said first AND gate providing said actuating signals and being coupled to the reset input of said first flip-flop;

a first OR gate receiving said scanning signal as a first input and receiving said second signals as a second input and providing an output signal to the set input of said first flip-flop;

a second OR gate receiving said scanning signal as a first input and providing an output signal to the set input of said second flip-flop;

a second AND gate receiving as inputs said first signals and the output of said first flip-flop, the output of said second AND gate being coupled as a second input to said second OR gate; and

a third AND gate receiving as inputs said first signals and the inverted output from said first-flop, the output of said third AND gate being coupled to the reset input of said second flip-flop;

the output of said first AND gate providing said actuating signals and being coupled to the reset input of said first flip-flop whereby said interference prevention system is responsive to said actuating signals for inhibiting the driving of at least one of two adjacent magnets for a predetermined period of time to thereby prevent magnetic interference between simultaneously energized magnets.

4,286,518

PRINT SCREEN STENCIL

Jacob A. Otthofer, Jr., Lancaster, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Jul. 25, 1979, Ser. No. 60,456
Int. Cl.³ B41N *1/24*
U.S. Cl. 101—128.21 **1 Claim**

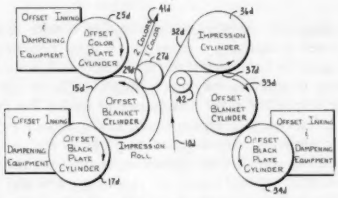
1. A print screen stencil for printing with corrosive printing

compositions comprising a screen fabric having open mesh areas in a predetermined pattern adapted to allow the passage of a printing composition to a substrate positioned beneath the fabric and filled or closed mesh areas adapted to prevent the passage of a printing composition, the filled mesh areas comprising a resist coating encasing the mesh in the filled areas, said resist coating comprising cross-linked acrylic polymer intimately dispersed in fused vinyl resin.

4,286,519
OFFSET LITHO CONVERSION FROM LETTERPRESS EQUIPMENT

Gary R. Smith, Bucyrus, Kans., assignor to Smith R.P.M. Corporation, Overland Park, Kans.

Continuation-in-part of Ser. No. 936,130, Aug. 23, 1978, abandoned. This application Feb. 15, 1979, Ser. No. 12,567
Int. Cl.[3] B41F *11/00, 5/18, 13/02;* **B41L** *17/12*
U.S. Cl. 101—138 **6 Claims**



1. The process of modifying conventional, continuous web and non-interchangeably convertible letterpress newspaper printing equipment, including cooperating first letterpress impression and plate cylinders generally horizontally spaced from and cooperating with second letterpress impression and plate cylinders within a single tower frame, to continuous web offset equipment; which process includes the steps of:

(a) modifying the first letterpress plate cylinder to accept an offset plate and thereby function as a first plate cylinder;

(b) mounting dampening and inking equipment on the tower frame in cooperation with said first offset plate cylinder;

(c) modifying said first letterpress impression cylinder to accept an offset blanket and thereby function as a first offset blanket cylinder;

(d) positioning a first offset impression cylinder in the tower frame so as to cooperate with said first offset blanket cylinder at a first bight removed from said first offset plate cylinder; said first offset impression cylinder not extending outwardly from said tower such that adjacent towers may be placed in close proximity without interference from said first offset impression cylinder;

(e) rotating said first offset impression cylinder; such that the speed of the surfaces of said first offset impression cylinder and said first offset blanket cylinder at said first bight are substantially the same;

(f) modifying a second letterpress plate cylinder to an offset plate cylinder to thereby function as a second offset plate cylinder;

(g) mounting dampening and inking equipment on the tower frame to cooperate with said second offset plate cylinder;

(h) modifying said second letterpress impression cylinder to accept an offset blanket and thereby function as a second offset blanket cylinder;

(i) positioning a second offset impression cylinder on the tower frame so as to cooperate with said second offset blanket cylinder at a second bight removed from said second offset plate cylinder; said second offset impression cylinder not extending outwardly from said tower such that adjacent towers may be placed in close proximity without interference from said second offset impression cylinder;

(j) rotating said second offset impression cylinder, such that the speed of the surfaces of said second impression cylinder and said second offset blanket cylinder at said second bight are substantially the same; and

(k) directing a continuous web between said first offset blanket cylinder and said first offset impression cylinder at said first bight and directing said web between said second impression cylinder and said second offset blanket cylinder at said second bight;

(l) modifying a third letterpress plate cylinder to accept a third offset plate within the tower frame and thereby function as a color third offset plate cylinder; said third offset plate cylinder cooperating with said first offset blanket cylinder and said first offset plate cylinder so as to transfer two colors to said first offset blanket cylinder;

(m) wherein said first impression cylinder is a new cylinder mounted in said letterpress tower frame; and including the steps of:

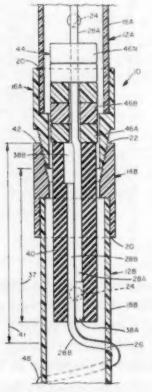
(n) directing said web to said first bight between said first offset blanket cylinder and said first offset impression cylinder; and

(o) directing said web to said second bight between said second offset blanket cylinder and said second offset impression cylinder, such that at least two colors are printed on one side of said web.

4,286,520
LINEAR EXPLOSIVE CHARGE WITH CONSTANT DETONATION VELOCITY AND SYNCHRONOUS BOOSTER CHARGES

Dallas R. Davis, Tulsa, Okla., assignor to Davis Explosive Sources, Inc., Tulsa, Okla.

Filed Aug. 13, 1979, Ser. No. 65,893
Int. Cl.[3] C06C *11/00*
U.S. Cl. 102—317 **8 Claims**



1. A linear explosive charge with constant detonation velocity, comprising;

(a) a plurality of series-connected units, or sticks, and means to colinearly join said sticks together in a long linear substantially rigid assembly;

(b) each stick comprising;

(1) a tubular member of selected length and diameter;

(2) a polarized coupling attached at each end, a female coupling at one end, and a male coupling at the other end;

(3) a helical winding of linear explosive cord on the outside surface of said tubular member, near each end of said stick, said explosive cord inserted through an opening in the wall of said stick, with the ends of said cord extending outwardly through said couplings for selected distances;

(4) at the end having the female coupling, a selected length of thick-walled elastic tube inserted over the end of said explosive cord into the end of said stick; the inner diame-

ter of said tube less than twice the diameter of said explosive cord;

whereby when the end of said cord extending from the male end of a first stick is inserted into said elastic tube inside the female coupling of a second stick, as the joint is made up, said elastic tube will expand and press both ends of the explosive cord together in tight side-by-side contact to facilitate the process of cross-detonation from the cord on one stick to the cord on the other stick.

4,286,521

DEVICE ACTUATED ELECTRICALLY TO TRIGGER A MECHANICAL PERCUSSION DETONATOR

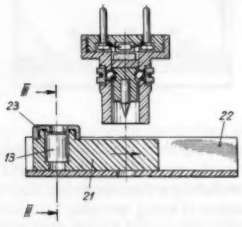
Joseph Marer, Lyss, Switzerland, assignor to Redon Trust, Schaan, Liechtenstein

Filed Jul. 25, 1979, Ser. No. 60,334

Claims priority, application Switzerland, Jul. 27, 1978, 8070/78

Int. Cl.³ F42C *19/06*

U.S. Cl. 102—200 **3 Claims**



1. An igniting device for percussion detonators, comprising

a tubular container;

a percussion striker device located in said container carrying;

a striker pin on one end thereof;

a detent device for detaining said striker device within said container;

an explosive cap located at the other end of said striker device;

a detonator housing;

at least one detonator charge movably mounted in said housing for movement between an operative position in the path of said striker and an inoperative position out of the path of said striker; and

actuating means for applying pressure to said other end of said striker device for igniting that detonator.

4,286,522

LATCH DEVICES

Brian T. Trayner, Stevenage, England, assignor to British Aerospace Public Limited Company, London, England

Filed May 31, 1979, Ser. No. 44,159

Claims priority, application United Kingdom, May 31, 1978, 25704/78

Int. Cl.³ F42C *15/34*

U.S. Cl. 102—255 **4 Claims**

1. A latch device including, in combination:

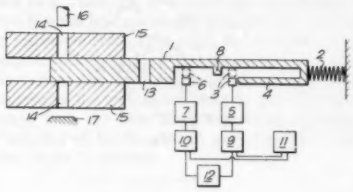
a movable member arranged for movement between first and second positions via fail-safe and intermediate positions successively;

biasing means biasing said member towards said second position;

first and second latch means each movable from an initial position to an activated position;

first abutment means carried by said member and engageable with said first latch means when in its initial position to retain said member in said first position and disengageable from said first latch means when in its activated position to allow movement of said movable member towards said second position, and said first abutment means being engageable with said second latch means when in its initial position to prevent movement of said member past said intermediate position and disengageable from said second latch means when in its activated position to allow movement of said member towards said second position; and

second abutment means carried by said member in spaced relation to said first abutment means and engageable with



said second latch means when in its activated position to prevent movement of said member past said fail-safe position if said member is at said first position at the time when said second latch means moves from its initial position to its activated position, whereby said member is allowed to move to said second position only if said member has moved past said fail-safe position at the time when said second latch means moves from its initial to its activated position.

4,286,523

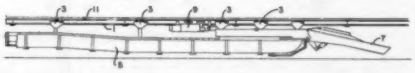
SYSTEM FOR SUPPORTING OVERHEAD TROLLEY RAIL

Neal W. Densmore, Franklin, Pa., assignor to Voy Manufacturing Co., Pittsburgh, Pa.

Filed Sep. 12, 1979, Ser. No. 74,688

Int. Cl.³ E01B *25/24*

U.S. Cl. 104—111 **10 Claims**



1. A system for supporting an overhead trolley rail from a mine roof or the like, comprising a washer-like element having a centrally-disposed opening therein, at least one curved portion depending downwardly from the washer-like element, a bolt extending across said curved portion and supported thereby, two L-shaped keepers at the ends of said bolt each having one leg through which its associated bolt extends and a second leg which underlies a flange on a trolley rail, and a single roof bolt extending through said centrally-disposed opening and into a mine roof or the like, said single roof bolt comprising the only support for said washer-like element.

4,286,524

PRESSURIZED HOPPER CAR INTERIOR SIDE AND ROOF BRACING SUPPORT STRUCTURE

Steve L. Jantzen, St. Louis, Mo., assignor to ACF Industries, Inc., New York, N.Y.

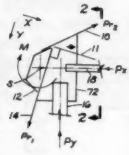
Filed Sep. 4, 1979, Ser. No. 71,968

Int. Cl.³ B61D *7/04, 17/08, 17/12, 49/00*

U.S. Cl. 105—248 **13 Claims**

1. A pressurized railway hopper car comprising: trucks supporting the car at opposite ends thereof; side sheets located on opposite sides of the car and extending vertically between transversely spaced side sills located at the lower portion of the

side sheets and transversely spaced side plates located at the upper portion of the side sheets; a roof extending between said side plates; included sheets attached to the lower portion of the side sheets defining at least one hopper in the car; at least one vertical reinforcement located on each side of said hopper; upper connecting means extending between each of said vertical reinforcements and its respective sie plate to anchor said reinforcement at its upper portion; lower connecting means



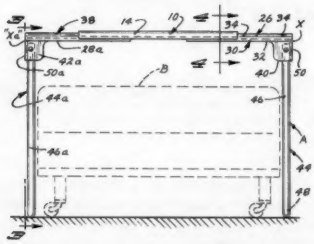
attaching said vertical reinforcement at its lower portion to its respective side sill; horizontally extending reinforcements extending between said upper connecting means at approximately the shear center of each side plate; said vertical reinforcements spaced inwardly from the shear center of its respective side plate a distance such that said vertical and said horizontal reinforcements carry substantially axial loads resulting from membrane pressure loads applied substantially uniformly upon said side sheets and upon said roof.

4,286,525

OVER-THE-BED-TABLE

Kathryn A. Willmore, 6509 Navaho Trail, Edina, Minn. 55424

Filed Feb. 19, 1980, Ser. No. 122,754
Int. Cl.[3] A47B *23/00, 1/00*
U.S. Cl. 108—93 **1 Claim**



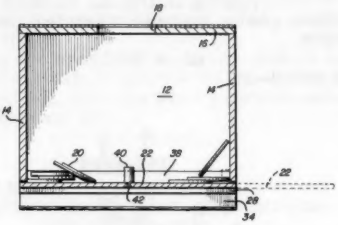
1. An Over-The-Bed table comprising:
(a) a top including a central portion,
(b) a first end portion, and
(c) a second and oppositely disposed end portion,
(d) means slidably mounting said first end portion on said central portion including an upstanding rib formed along each edge of said first end portion and slideably positioned in
(e) a slot formed in the underside of an upstanding rib formed along each edge of said central portion,
(f) means slideably mounting said second end portion on said central portion including an upstanding rib formed along each edge of said second end portion and slideably positioned in said slots of said upstanding ribs of said central portion,
(g) first leg means,
(h) second leg means,
(i) means hingedly mounting said second leg means on said second end portion for extension of said leg means to from said top to a position on a supporting surface for supporting said top above the top surface of a bed,
(j) each of said first and second leg means having a length sufficient to support said top portions extended above the top surface of a bed positioned between said first and second leg means and under said top portions.

4,286,526

COIN BANK

Nicholas A. Rabelos, Jonesboro, Ga., assignor to Charles J. Simpson, Morrow, Ga.

Filed Dec. 12, 1979, Ser. No. 103,511
Int. Cl.[3] A45C *1/12*
U.S. Cl. 109—73 **4 Claims**



1. A coin bank comprising a hollow, rectangular parallelepiped receptacle with perpendicularly arranged walls with at least one wall including a coin receiving slot therein, another wall of said receptacle being movable between a closed position and an open position, and a concealed locking device for the movable wall to releasably retain it in closed position to prevent unauthorized removal of coins from the coin bank, said locking device including a small concealed passageway communicating with the exterior of the receptacle enabling insertion of a long narrow tool for disabling the locking device to enable the movable wall to be moved to an open position, said movable wall being the bottom wall of the receptacle, means slidably supporting the bottom wall from the side walls of the receptacle, said locking device being mounted on the side wall of the receptacle and including a locking member movably received in a recess in the slidable bottom wall, said passageway communicating with the bottom of the recess to enable the locking member to be moved out of the recess in the slidable bottom wall to enable sliding movement of the bottom wall, said locking device including a leaf spring member fixedly secured to the side wall at one end and including a laterally extending flange forming said locking member at the other end for movement into and out of the recess in the bottom wall, each side wall including a metal member extending below the bottom wall and terminating in an inturned flange having an upturned flange at its inner edge to define a channel-shaped guide, said bottom wall including longitudinal runners received in the guides to guide the movement of the bottom wall and limit lateral distortion of the side walls, thereby strengthening and rigidifying the receptacle.

4,286,527

SYSTEM FOR ASH REMOVAL

Storm D. Robinson, Vernon, and Douglas M. Rode, Newington, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

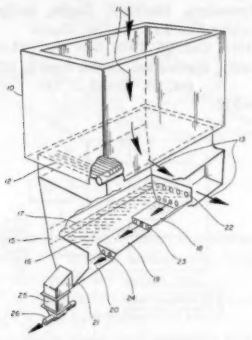
Filed Dec. 10, 1979, Ser. No. 101,653
Int. Cl.[3] F23J *1/02*
U.S. Cl. 110—165 A **3 Claims**

1. A back-pass section of a furnace burning solid fuel which produces fly ash carried into the back-pass by entraining heating gases as products of the combustion, including,
a section of back-pass from a furnace including a first down-

wardly directed portion and a second portion connected to the first portion at substantially a right angle,

a receptacle positioned below the gas descending in the first portion of the back-pass,

a body of liquid impounded by the receptacle having a surface receiving fly ash from combustion gases flowing from the first back-pass portion into the second back-pass portion as the entraining gases are diverted in their downward path from the first portion into a second path within the second portion,



a series of step surfaces beneath the su[illegible] of the body of liquid receiving fly ash gravitated [illegible]ugh the body of liquid,

an exit from the receptacle located at the lowest of the step surfaces,

a nozzle for each step surface arranged to direct liquid supplied to the nozzle over its step surface in removing ash from the step surface to the exit at the lowest of the step surfaces,

a supply of liquid for each of the nozzles,

and a conduit connected to the exit through which fly ash is continuously removed.

4,286,528

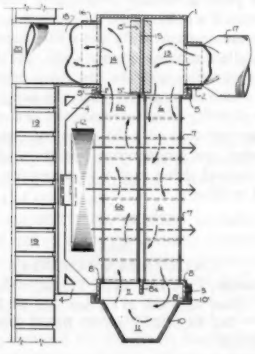
EXHAUST FILTER SYSTEM

Stephen Willard, 45 Elm St., Woodstock, Vt. 05091

Filed Aug. 30, 1979, Ser. No. 71,126

Int. Cl.³ F23J *15/00*

U.S. Cl. 110—203 **16 Claims**



1. An exhaust filter system for filtering a creosote component from exhaust gases of a combustion chamber burning wood, which comprises an airtight filter apparatus arranged between a combustion chamber outlet for the exhaust gases and a flue for removing the filtered exhaust gases, the filter apparatus including a gas distributing chamber in communication with the combustion chamber outlet and receiving hot exhaust gases therefrom, a gas collecting chamber in communication with the flue and delivering filtered exhaust gases thereto, a heat exchange unit airtightly connecting the gas distributing and collecting chambers, the heat exchange unit defining a vertical flow path for the exhaust gases between the gas distributing and collecting chambers and being capable of cooling the gases to a temperature range wherein the creosote component present in the hot exhaust gases in vaporized form is condensed to a liquid, the heat exchange unit being comprised of two rows of heat exchange tubes and two tube plates attached to respective ends of the tubes, the two rows of tubes being arranged back-to-back, a fan means for blowing air transversely across the heat exchange tubes, and a sump mounted to receive the condensed liquid by gravity from the heat exchange unit, the filter apparatus being arranged to provide a natural draft for the exhaust gases from the combustion chamber outlet to the flue.

4,286,529

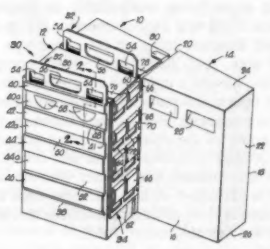
COMBINATION HANGER AND EXPANSION PLATE FOR ELECTRIC FURNACE ROOF

John J. Musser, Kansas City, Mo., assignor to Geo. P. Reintjes Co., Inc., Kansas City, Mo.

Filed Apr. 13, 1979, Ser. No. 29,932

Int. Cl.³ F23B *7/00*

U.S. Cl. 110—340 **2 Claims**



1. A spacing member for positioning between adjacent refractory bricks, said member comprising an elongated sheet of metallic material having an upper margin and a lower margin and configured to present, on at least one face thereof, a plurality of spaced brick-engaging surfaces along the length of the sheet between said margins, said surfaces comprising elongated, flattened ribs presenting upper and lower rib margins, with channels between adjacent ribs, said ribs being of generally rectangular configuration, only one of said upper and lower ribs margins being connected to said sheet, the connected rib margin being the only connection between the ribs and the sheet.

4,286,530

MULTIPLE ROW SEED PLANTER WITH COMMON SEED STORAGE

Richard L. Conley, Rte. 2, Box 210, Blytheville, Ark. 72315

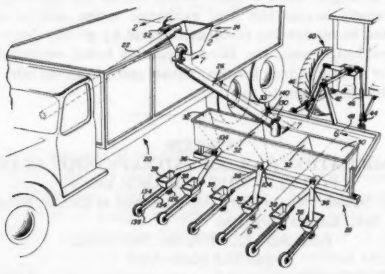
Filed Jul. 26, 1979, Ser. No. 62,153

Int. Cl.³ A01C *5/00;* **B60P** *1/00*

U.S. Cl. 111—1 **9 Claims**

1. An agricultural implement for dispensing grain, seeds or fertilizer from a mobile storage receptacle having an open top and upwardly extending sidewalls comprising receiving bin means mountable on one of said sidewalls and having filling means for transferring seed or fertilizer from the receptacle to the receiving bin means, and connecting means for transfer of said seed or fertilizer from the receiving bin means to a planter

means, said connecting means comprising a telescoping feed pipe having at least one pipe slidable within a second pipe, whereby the longitudinal extent of the feed pipe is adjustable, the planter means comprising a towable frame on which is mounted a common feed tank for receiving seed or fertilizer from the connecting means, the feed tank having distributing means for transfer of seed or fertilizer to a plurality of individual planter hoppers for dispensing the seed or fertilizer into the ground, said telescoping feed pipe being further swivelable about a swivel housing connected by a transition pipe to the receiving bin, whereby the telescoping feed pipe is movable in a horizontal plane by swivelling about the swivel housing, said filling means comprising a powered auger consisting of a spiral auger blade fittingly rotatable in an auger housing for upward



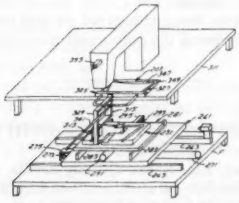
lifting of said seed or fertilizer from the receptacle into the bin, said powered auger being controllable in operation from a location remote from said auger, whereby filling of said bin is facilitated, said location being on the outer pipe of said telescoping feed pipe, said distributing means comprising a Y-shaped feed line having a common segment connected to said common feed tank and a pair of terminal segments connected to the common segment and located between the common segment and a pair of the plurality of plant hoppers, whereby gravity flow of seed or fertilizer from said common feed tank to the hopper is facilitated, and further wherein said telescoping feed pipe is provided with a feed pipe flow control gate, whereby the rate of flow of seed or fertilizer therethrough into the feed tank is adjustably controllable.

4,286,531

SEWING APPARATUS

Normand Molloy, Arundel, Canada, assignor to Edward A. Shaw, Montreal, Canada

Filed Sep. 10, 1979, Ser. No. 73,607
Int. Cl.[3] D05B *21/00*
U.S. Cl. 112—121.15 **9 Claims**



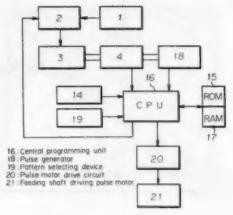
1. An apparatus for use in substantially automatically sewing articles along a symmetrical, open-ended path comprising means for mounting each article on a support; means for moving the support to sew along the path from either end of the path to the other end, said support moving means including a first platform mounted for movement along a straight line, a second platform mounted for movement, on the first platform, along a straight line which is perpendicular to the first line, the support fixed to the second platform; first and second fluid operated devices to move the first and second platforms respectively in both directions in their straight line movement; and a hydraulic selector valve to sequentially control the operation of the first and second fluid operated devices.

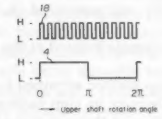
4,286,532

SEWING MACHINE WITH A DEVICE FOR DIRECTLY DRIVING THE FEEDING SHAFT

Yoshinobu Tonomura, Hachioji, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1978, Ser. No. 955,478
Claims priority, application Japan, Apr. 6, 1978, 53/39749
Int. Cl.[3] D05B *27/00*
U.S. Cl. 112—314 **3 Claims**





1. In a sewing machine with a reciprocating needle, a needle plate and a feed dog, an improvement designed to eliminate loose stitches and needle breakage caused by lack of synchronization between needle movement and fabric feed, comprising: a first drive motor mechanically connected to the needle to vertically reciprocate the needle when the first drive motor is operated; a second drive motor mechanically connected to the feed dog to operate the feed dog when the second drive motor is operated; a microcomputer cooperating with the first and second drive motors to synchronize needle reciprocation and feed dog operation while the first and second drive motors are operated; and a first pulse generator and a second pulse generator, the first pulse generator cooperating with the first drive motor to produce a pulse signal with a first logical state when the needle is moving upwardly and with a second logical state when the needle is moving downwardly, and the second pulse generator cooperating with the first drive motor to produce a pulse train which is in phase with and subdivides the pulse signal into a plurality of subintervals, the first and second pulse generators cooperating with the microcomputer, whereby the microcomputer can synchronize operation of the first drive motor and second drive motor in dependence upon needle position and motion.

4,286,533

CATAMARAN SAILBOAT

Sidney N. Sanner, P.O. Box 1173, Tryon, N.C. 28782

Filed Aug. 23, 1979, Ser. No. 69,241
Int. Cl.[3] B63B *35/00*; B63H *9/00*
U.S. Cl. 114—39 **15 Claims**

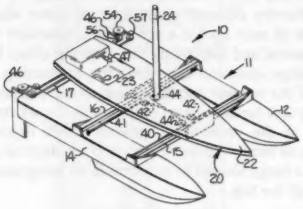
1. A catamaran sailboat characterized by the ability to limit heeling under various headings to thereby maximize the effective sail area and speed, and comprising

a hull assembly comprising a pair of separate hulls, and means fixedly interconnecting said hulls in a laterally

spaced apart and laterally aligned relationship, and with said hulls being adapted to buoyantly support the full weight of the sailboat,

a deck assembly comprising a deck adapted to support the crew of the sailboat, and a mast fixed to said deck for supporting a sail,

means mounting said deck assembly to said hull assembly to



permit relative lateral movement therebetween, and with the deck assembly being at an elevation so as to be free of buoyant contact with the water, and

means for effecting relative lateral movement between said deck assembly and said hulls,

whereby the weight of the deck assembly and crew may be selectively moved laterally toward the windward hull to minimize heeling of the sailboat.

4,286,534

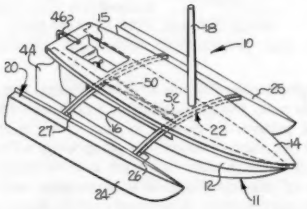
TRIMARAN SAILBOAT

Sidney N. Sanner, P.O. Box 1173, Tryon, N.C. 28782

Filed Aug. 23, 1979, Ser. No. 69,242

Int. Cl.[3] B63B *35/00*; B63H *9/00*

U.S. Cl. 114—39 **10 Claims**



1. A trimaran sailboat characterized by the ability to limit heeling under various headings to thereby maximize the effective sail area and speed, and comprising

a central hull,

a mast mounted on said central hull for supporting a sail,

a boom assembly comprising a boom having an arcuate curvature along its length, and an outrigger hull mounted at each end of said boom,

means mounting said boom assembly laterally across said central hull and so as to permit relative lateral movement therebetween, and with the center of curvature of said boom being disposed below said central hull, said mounting means including cable means for limiting canting between said boom assembly and said central hull and comprising first and second cables fixedly interconnected between said outrigger hulls, with the ends of each cable being fixed to opposite hulls at longitudinally spaced points, and pulley means mounted on said central hull and operatively engaging each cable so that each cable includes a medial portion which extends in a direction having a substantial longitudinal component, and

means for selectively moving said boom assembly laterally with respect to said central hull,

whereby lateral movement of the boom assembly in the leeward direction results in the leeward outrigger hull being moved outwardly from the central hull and downwardly with respect thereto, to thereby increase the leverage and buoyancy of the leeward outrigger hull and thus minimize heeling of the sailboat.

4,286,535

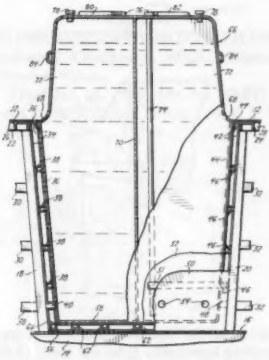
SHIP FOR LIGHTER-THAN-WATER FLUIDS

Eugene Lunn, 1217 Gilbert Ave., St. Louis, Mo. 63119

Continuation-in-part of Ser. No. 909,253, May 24, 1978, abandoned. This application Sep. 10, 1979, Ser. No. 74,397

Int. Cl.[3] B63B *25/08*

U.S. Cl. 114—74 R **12 Claims**



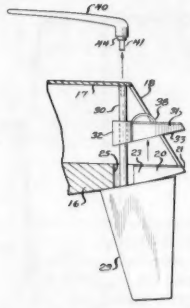
1. A ship which is adapted to carry fluids and that comprises a plurality of members which are fixedly secured within the hull of said ship to define a plurality of large open-top, transversely-spaced and laterally-spaced recesses which have the lower areas thereof disposed below the water line of said ship, said members being mounted so the horizontal area of the upper portion of each recess is larger than the horizontal area of the lower portion of said recess, a plurality of large, substantially fluid-tight containers that normally are disposed within said recesses, said containers having configurations which enable portions thereof to bear against and to receive support from confronting portions of said recesses, said portions of said containers and said confronting portions of said recesses providing areas of engagement which are substantially greater than line contacts, said containers having partitions therein which subdivide each of said containers into a plurality of substantially fluid-tight compartments, said containers having the lower areas thereof extending below said water line of said ship, said portions of said containers and said confronting portions of said recesses being free of locking members whereby said containers are held within said recesses solely by the force of gravity and by frictional forces, said containers being supported and held within said ship, by gravity and by said frictional forces and the resulting engagements between said portions of said containers and said confronting portions of said recesses, throughout the entire periods of time when fluids are introduced into or removed from said containers, some of said portions of said containers being parts of the sides of said containers which are intermediate said partitions and the ends of said containers and which respond to the weights of the fluid contents of said containers to bow outwardly and apply forces to the sides of said recesses that resist separation of said containers from said recesses while said ship is afloat, said some portions of said containers when said containers are filled with lighter-than-water fluids, responding to any sinking of said ship to automatically bow away from said sides of said

recesses and thereby help said containers float up out of said recesses and rise to the surface of the water being holding and confining the fluid contents thereof to prevent the loss therefrom of the fluid contents thereof, said containers having portions thereof which engage confronting portions of said recesses adjacent the upper edges of said recesses to render said open-top recesses substantially closed-top recesses whenever said containers are disposed within said recesses.

4,286,536
REMOVABLE RUDDER ASSEMBLY

Hobart L. Alter, Capistrano Beach, Calif., assignor to Coast Catamaran Corporation, Oceanside, Calif.

Filed Aug. 6, 1979, Ser. No. 63,966
Int. Cl.[3] B63H *25/06*
U.S. Cl. 114—165 **10 Claims**

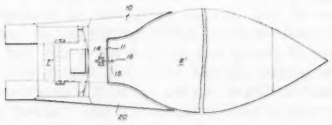


1. A removable rudder assembly for a boat having a hull with a slot extending forwardly from the stern of the boat, the slot having an open rear end at the stern, the rudder assembly comprising a rudder lock member adapted to fit into said slot, a rudder shaft extending through an opening in said rudder lock member and being pivotable therein, a rudder attached to the lower end of the rudder shaft, and a tiller attached to the upper end of the rudder shaft, whereby the rudder and the rudder shaft can be removed from the boat by removing the rudder lock member from the slot and moving the rudder shaft rearwardly within the slot through the open rear end of the slot.

4,286,537
SEAGOING SEPARABLE TUG AND BARGE CONSTRUCTION

J. Erik Hvide, 1900 SE. 17th St., Ft. Lauderdale, Fla. 33316

Filed Jan. 10, 1979, Ser. No. 2,384
Int. Cl.[3] B63B *21/00*
U.S. Cl. 114—248 **3 Claims**

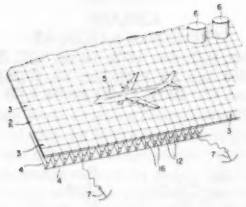


1. In a separable tug and barge assembly having a twin hull tug unit provided with a horizontally disposed shelf element connecting the twin hulls together, a barge unit having a tongue element extending rearwardly from the aft end thereof for engagement with the shelf element of the tug unit to hold one another in tight relationship, the tug unit having a portion of the forward end of each hull shaped to conform with the curvature of a portion of the aft end of the barge unit to insure a substantially tight mating engagement therebetween, wedging means between the tug and barge units to insure a tight engagement therebetween and to eliminate any relative movement therebetween, and means for connecting and disconnecting the tug and barge units to one another, the improvement comprising a tug unit having a pair of twin diverging hulls spaced from one another at the bow end thereof such that the outboard sides are not parallel to the center line of the combined tug and barge, each of said hulls extending outwardly at its bow end forming an angle of divergence from the center line of the tug unit of between about 3.0 degrees to about 5.0 degrees thereby enhancing the flow of water along the outboard side of each hull in a converging direction towards the aft end thereof and improving the wedging effect between the tug and barge units and enhancing the connecting and disconnecting of the tug unit and barge unit to one another, each hull of the tug unit being skewed outboard at the aft end thereof at an angle to the vertical of between 15–30 degrees thereby providing an improved water flow and a reduction in the water drag and a barge shaped to conform in an integrated state with the lines of the tug.

4,286,538
MULTIPURPOSE FLOATING STRUCTURE

Atsushi Matsui, 12, Baban-cho, Shizuoki-shi, Shizuoka-ken, Japan

Filed Jan. 30, 1979, Ser. No. 7,914
Claims priority, application Japan, Feb. 1, 1978, 53-11010
Int. Cl.[3] B63B *35/00*
U.S. Cl. 114—266 **5 Claims**



1. A multipurpose floating structure comprising a plurality of flotation units joined together in a coherent, tesselated or reticulated pattern, as viewed in plan view, in at least one horizontal tier, each flotation unit comprising: a flat plate of a geometrical shape in plan view such as to fit snugly with the flat plates of adjacent flotation units to form said pattern; a watertight can structure of inverted conical shape, of a vertex angle of the order of 90 degrees, fixed at the base thereof in a watertight manner to the lower surface of the flat plate; a vertical leg column fixed at the upper end thereof to the lower vertex part of the can structure and having connection means at the lower end thereof; a weight disposed around and supported on the leg column; and connecting means for connecting the flotation unit to adjacent flotation units to form said pattern.

4,286,539
DUAL BUOYANCY DEVICE

Joseph Pignone, 16 Benvenue Ave., West Orange, N.J. 07052

Continuation-in-part of Ser. No. 893,266, Apr. 5, 1978, abandoned. This application Oct. 18, 1979, Ser. No. 86,173
Int. Cl.[3] B63G *8/14*
U.S. Cl. 114—331 **7 Claims**

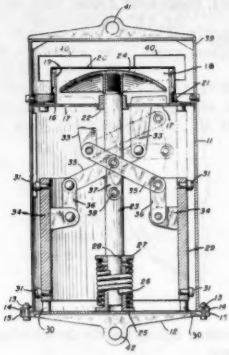
1. A dual buoyancy device alternately having a small and a large external dimension comprising,

(a) a chamber,

(b) an opening in the chamber,

(c) an elastic sheet affixed to and hermetically sealing the opening in the chamber,

(d) a thruster in the chamber normally gravitationally disposed in nondistending relation to the sheet,
(e) the thruster gravitationally movable when the chamber is inverted, to distend the sheet and to enlarge the external dimension of the chamber,
(f) the chamber, in sinking mode, with the sheet undistended,



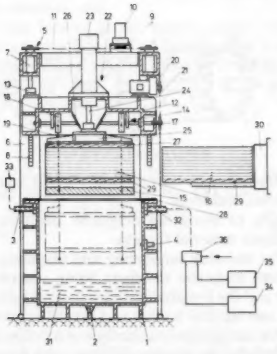
being normally externally dimensioned to displace a weight of liquid in which it is immersed, which weight of liquid is less than the weight of the chamber,
(g) the chamber, in floating mode, with the thruster distending the sheet to enlarge the external dimension of the chamber, being then dimensioned to displace a weight of liquid which is greater than the weight of the chamber.

4,286,540

APPARATUS FOR STRENGTHENING POROUS PLATES BY IMPREGNATION

Oskar Bernath, Umiken, Switzerland, assignor to Georg Fischer Brugg-Oehler AG, Switzerland

Filed Mar. 13, 1979, Ser. No. 20,246
Claims priority, application Switzerland, Apr. 4, 1978, 3595/78
Int. Cl.³ C23C *13/08*
U.S. Cl. 118—50 **11 Claims**



1. An apparatus for impregnating the edge areas of plates made of a porous material with a hardening fluid for strengthening and solidifying the edge areas comprising the combination of

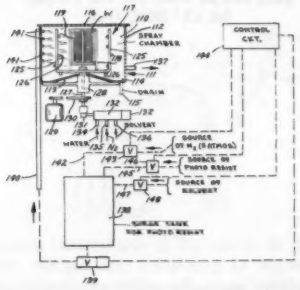
a container for holding a body of hardening fluid;
a cover for said container, said cover being liftable and lowerable away from and toward said container between an open position and a closed position;
means for lifting and lowering said cover;
means for forming an airtight seal between said cover and container when closed;
a support frame attached to said cover for supporting from below a stack of plates to be treated;
means for lifting and lowering said support frame with a stack of plates to be treated supported therein relative to said cover between a first position above the hardening fluid and a second position submerged in the hardening fluid while said cover is sealed and to said container;
means carried by said cover for applying pressure to the top of said stack of plates; and
means coupled to said container for varying the pressure therein from a pressure substantially below atmospheric pressure to a presure at least as great as atmospheric pressure.

4,286,541

APPLYING PHOTORESIST ONTO SILICON WAFERS

Robert S. Blackwood, Chanhassen, Minn., assignor to FSI Corporation, Chaska, Minn.

Filed Jul. 26, 1979, Ser. No. 60,973
Int. Cl.³ B05C *5/00, 11/06, 11/08, 13/02*
U.S. Cl. 118—52 **3 Claims**



1. Apparatus for applying photoresist to silicon wafers in the manufacture of integrated circuit chips, comprising

enclosure means defining a closed chamber, the enclosure means including elongate peripheral walls and end walls traversing the peripheral walls and enclosing the chamber,
an upright rotor in the chamber and revolving about an upright rotation axis extending transversely through the end walls, the rotor having elongate molded plastic carrier means with vertically spaced wafer edge supports for supporting such silicon wafers to lie transversely of the rotation axis in spaced and confronting relation to each other along and substantially concentric of the rotation axis, the carrier means having unobstructed openings at the sides thereof and extending vertically along significant portions of the length of the peripheral walls, each of the openings having a vertical length in excess of the vertical spacing between a plurality of the wafer edge supports and the spaces therebetween and each of the openings having a horizontal width of the same order of magnitude as the horizontal spacing between adjacent wafer edge supports to provide ready access to the wafers carried on the supports, and plurality of vertically spaced and horizontally directed nozzles in the chamber and adjacent the rotor, the nozzles being arranged in an upright row oriented endwise of the rotor, and being directed toward the rotor and rotation axis, and confronting the openings at the sides of the enclosure means to spray directly across and onto the wafers on the rotor, and
a supply of photoresist connected to the nozzles for spraying

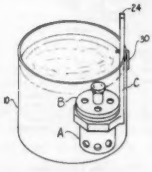
onto the wafers, and the supply of photoresist including a closed measuring tank, and a valved source of high pressure gas under a continuing plurality of atmospheres of pressure and connected to the tank, the valved source being open and applying the continuing plurality of atmospheres to blow the entire measured quantity of photoresist from the tank and through the nozzles for application to the wafers, the high pressure on the gas being significant and substantially in excess of the small variations in pressure in the liquid photoresist at the nozzles caused by the vertical spacing of the nozzles whereby to equalize the quantity of photoresist sprayed from the several nozzles onto various silicon wafers.

4,286,542

LIQUID IMMERSION APPARATUS FOR MINUTE ARTICLES

Jewell G. Belcher, Jr., and Ben R. Hollis, Jr., both of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 18, 1980, Ser. No. 171,933
Int. Cl.³ B05C *3/02*
U.S. Cl. 118—423 **4 Claims**



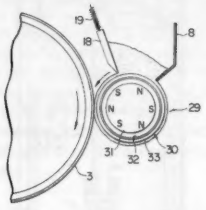
1. Apparatus for immersing minute integrated circuit chips in an etching solution comprising:
- a basket member having an open top and side and bottom walls;
- a plurality of minute fluid passages formed in said side and bottom walls of the said basket member;
- a removable lid member for enclosing said open top of said basket member having a plurality of minute fluid passages formed therein preventing air pockets in said basket during use;
- said fluid passages being dimensioned to retain said minute chips in said container against buoyancy and solution turbulence while allowing complete circulation of fluid through the interior of said basket and outwardly through said lid member;
- said basket and lid members being constructed of a non-corrosive frictional material and being dimensioned relative to one another affording a frictional fitting therebetween to provide a unitary structure whereby said lid member is retained on said basket member against fluid pressure during use;
- a holder member including an upstanding handle portion;
- basket support means carried adjacent one end of said handle portion for supporting and retaining said basket member for immersion; and
- said handle portion including a plurality of vertically spaced attachment means for adjustably securing said holder assembly to associated structure whereby said basket member is supported in said solution at a desired level therein.

4,286,543

APPARATUS FOR DEVELOPING ELECTROSTATIC IMAGE

Teruyuki Ohnuma, Yokohama; Seiichi Miyakawa, Nagareyama, and Hajime Oyama, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 8, 1979, Ser. No. 37,324
Claims priority, application Japan, May 16, 1978, 53-58083
Int. Cl.³ G03G *15/09*
U.S. Cl. 118—657 **13 Claims**



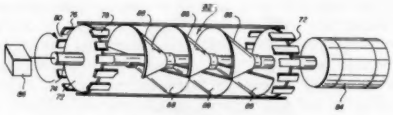
1. A development apparatus for developing a electrostatic image comprising:
- a developer applicator member having a conductive and elastic endless surface which bears a one-component type developer thereon,
- means for moving said developer applicator member at a slightly higher peripheral speed that that of a latent electrostatic image bearing member which bears a latent electrostatic image to be developed,
- a developer container for supplying said developer to said developer applicator member, and
- a blade electrode for charging said developer to a predetermined polarity, which is disposed in pressure contact with said developer on the surface of said developer applicator member.

4,286,544

CROSS-MIXING SYSTEM

John C. Witte, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 2, 1980, Ser. No. 136,625
Int. Cl.³ G03G *15/09*
U.S. Cl. 118—657 **22 Claims**



1. An apparatus for developing a latent image with developer material, including:
- a plurality of elongated magnetic members for attracting developer material thereto;
- means for movably supporting said magnetic members with adjacent magnetic members being spaced from one another and the longitudinal axes thereof substantially parallel to one another so that said magnetic members form the exterior circumferential surface of a cylindrical configuration defining an interior chamber with developer material passing between adjacent magnetic members to the interior chamber, said supporting means moving said magnetic members to transport developer material to the latent image so as to deposit developer material thereon; and
- means, mounted on said support means in the interior chamber of the cylindrical configuration defined by said mag-

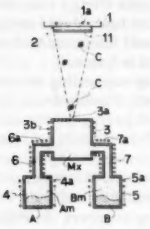
netic members to move in unison therewith, for mixing the developer material passing between adjacent magnetic members.

4,286,545

APPARATUS FOR VAPOR DEPOSITING A STOICHIOMETRIC COMPOUND

Toshinori Takagi, Nagaokakyo; Kiyoshi Morimoto, and Hiroshi Watanabe, both of Mobara, all of Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Continuation of Ser. No. 877,502, Feb. 13, 1978, abandoned. This application Oct. 1, 1979, Ser. No. 80,219
Claims priority, application Japan, Mar. 10, 1977, 52-25494
Int. Cl.³ C23C *13/12*
U.S. Cl. 118—723 **2 Claims**



1. An apparatus for producing compounds from at least three substances, said apparatus comprising:

one crucible for each of said substances, each of said crucibles adapted to hold one said substance;

means for individually heating each said crucible and vaporizing said substances contained therein;

a mixing chamber for heating and mixing said vapors to form a mixed vapor, said mixing chamber including heating means therefor;

at least one injection hole in said mixing chamber for jetting said mixed vapor into a vacuum region;

communication pipes connecting said mixing chamber to each of said crucibles, each said communication pipe including heating means in the vicinity of said mixing chamber and a nozzle portion having a narrowed diameter at the end of said pipe communicating with the inlet of said mixing chamber; and

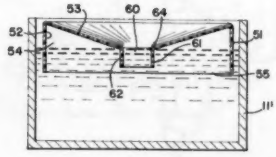
a substrate holder located in the vacuum region and in the path of said jetted vapor and adapted to hold a substrate on which are deposited clusters produced from said mixed vapor.

4,286,546

DOG WATERING DISH

Terry F. Moore, 550 Highland Dr., Danville, Calif. 94526

Filed Jan. 21, 1980, Ser. No. 113,770
Int. Cl.³ A01K *7/00*
U.S. Cl. 119—61 **16 Claims**



13. An anti-splash container for an animal comprising container means to retain a liquid for consumption by an animal, said container means having an open upper portion,

a container closure for covering at least a portion of said opening of said container means to prevent splashing of the liquid from the container during consumption by an animal,

said container closure having an access aperture means formed therein to permit penetration therethrough by an animal for access to the liquid retained in the container means, and

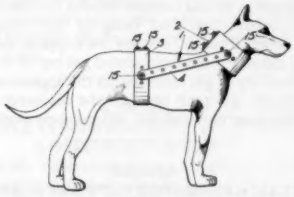
said container closure having flange means about the outer peripheral edge thereof and said access aperture means which extend downwardly therefrom into a liquid contained within said container means to form an air entrapment chamber between said flange means to float said container closure on the surface of the liquid retained in said container means.

4,286,547

ANIMAL RESTRAINT UNIT

Robert E. Neubauer, 1032 N. Bend Rd., Cincinnati, Ohio 45224, and Gunther B. Niemann, 1136 Hampstead Rd., Cincinnati, Ohio 45231

Filed Jan. 28, 1980, Ser. No. 116,294
Int. Cl.³ A01K *15/04*
U.S. Cl. 119—96 **6 Claims**



1. An animal restraint unit of the type to be worn by the animal, said restraint unit comprising an adjustable collar mountable about the animal's neck, an adjustable waistband mountable about the animal's body just behind the rib cage and a pair of elongated, rectilinear, lateral pieces, said lateral pieces being pivotally and releasably connected at substantially diametric positions to said collar and to said waistband and extending therebetween along the animal's sides, said connections of said lateral pieces to said collar and to said waistband being adjustable to properly fit the animal, these portions of said lateral pieces extending between said collar and said waistband being of such length that said restraint unit prohibits the animal from twisting his body laterally for purposes of licking, biting or gnawing posterior portions thereof or for purposes of pawing or scratching anterior portions thereof with his hind paws.

4,286,548

GAS RECIRCULATION APPARATUS WITH INTEGRAL ASH HOPPERS

Leslie O. Brash, 8810 Concord Dr., Westfield Center, Ohio 44251

Filed Nov. 19, 1979, Ser. No. 95,918
Int. Cl.³ F22B *33/00*
U.S. Cl. 122—1 R **3 Claims**

1. An apparatus for receiving particulate entrained flue gas from a vapor generator and returning a portion of the flue gas for recirculation through the generator, the apparatus comprising:

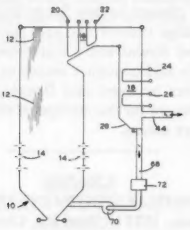
a. a plurality of spaced flow channels in flow communication with the flue gas being discharged from the generator;

b. a plurality of plate members, each plate member being interposed between adjacent flow channels to define flow

passages therebetween, the plate members causing the flue gas to change direction and flow through the passages;

c. a conduit in flow communication with said flow passages for conducting out of the apparatus that part of the flue gas which is not recirculated, said conduit located on a side of the apparatus which faces away from the generator;

d. a plurality of ash hoppers disposed below the plate members for receiving particulate matter which precipitates out of the flue gas;



e. a flow space disposed so as to receive the flue gas which has passed through the channels and direct said gas to flow between the hoppers;

f. a recirculation duct situated below and on the same side of the apparatus as said conduit thereby facilitating access to the generator, said duct being in flow communication with the gas flowing between the hoppers, said duct providing egress for the recirculated gas out of the apparatus,

g. a multiplicity of gas turns within the apparatus producing a serpentine gas path between the discharge of flue gas from the generator and the recirculation duct.

4,286,549

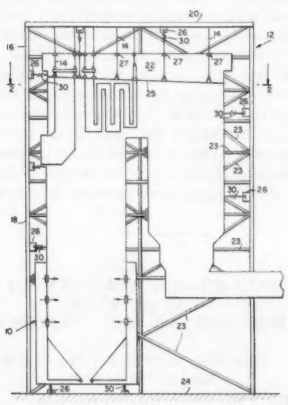
STEAM GENERATOR SUPPORT SYSTEM

Frantisek L. Eisinger, Demarest, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Dec. 3, 1979, Ser. No. 99,677

Int. Cl.[3] F22B *37/24*

U.S. Cl. 122—510 **7 Claims**



1. An apparatus for top-supporting a steam generator from a base, said steam generator including relatively flexible front, side and rear walls, a roof and a floor and having a low natural frequency, said apparatus comprising:

(a) a frame including a laterally extending member disposed above said steam generator and spaced vertically from said steam generator; and a plurality of upstanding members connected at respective upper ends to said laterally extending member and at respective lower ends to said base;

(b) means for connecting said steam generator to said laterally extending member; and

(c) means for connecting said steam generator to said upstanding members, said means including a plurality of dampers disposed at a plurality of elevations along the height of said steam generator, adapted to react to lateral displacement of said upstanding members and arranged to absorb forces resulting from lateral displacement of said frame, and a plurality of springs, said dampers arranged such that at least one of said springs is serially connected to a respective one of each of said dampers, said springs and dampers together defining combination spring-dampers connected between said steam generator and said upstanding frame members, whereby said spring-dampers absorb and dissipate energy transmitted during displacement of said frame toward said upstanding members such that stressing of said frame and said steam generator due to said displacement is lessened.

6. In a method of top-supporting from a base a steam generator including relatively flexible front, rear and side walls, a floor and a roof and having a low natural frequency, said method being of the type wherein said steam generator is hung from a frame, said frame including a laterally extending member adjacent the top of said steam generator and a plurality of upstanding frame members connected between said base and said laterally extending members, the improvement comprising the steps of:

(a) disposing a plurality of dampers at a plurality of elevations along the height of said steam generator, said dampers being adapted to react to lateral displacement of said upstanding members and located between said steam generator and said upstanding frame members, and

(b) connecting said dampers between said steam generator and said upstanding frame members and connecting springs between said steam generator and said frame members, each of said springs being serially connected to respective ones of said dampers, each spring and damper together forming a combination spring-damper connected between said steam generator and said upstanding frame members, whereby said spring-dampers will absorb and dissipate energy transmitted from said frame through said upstanding members toward said steam generator such that stress of said frame and said steam generator by movement of said frame is lessened.

4,286,550

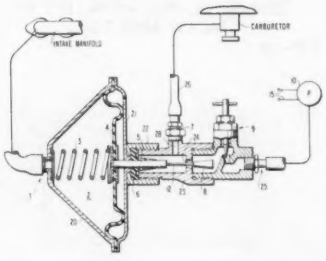
FUEL ADDITIVE INJECTION DEVICE

Arlin C. Lewis, Box AU, Libby, Mont. 59923

Filed Apr. 13, 1979, Ser. No. 30,047

Int. Cl.[3] F02D *19/00*

U.S. Cl. 123—25 L **3 Claims**



1. A device for injecting a fuel additive into the intake system of an automotive engine, the amount of fuel additive in-

jected being dependent upon engine load conditions, comprising in combination:

a vacuum chamber, said chamber being adapted to be operatively connected to a source of vacuum in an intake manifold of said engine;

a movable diaphragm, said diaphragm forming one wall of said chamber such that said diaphragm moves in response to changes in pressure in said chamber;

a bias spring in said chamber urgining said diaphragm in one direction;

a control rod connected to said diaphragm on the side thereof opposite said chamber;

an adjustable inlet passage for supplying a fuel additive fluid;

a pump for delivering said fuel additive under pressure;

a flow control passage in fluid communication with said inlet passage for supplying additive into said intake system;

a tapered valve seat formed within said flow control passage, said control rod extending through an aperture in said valve seat;

a fixed valve control member coupled to said control rod and disposed relative to said valve seat to engage therewith and comprising a flared portion which uniformly increases in diameter in a direction away from said chamber to match the taper of said valve seat, wherein changes in pressure in said chamber move said control rod and said valve control member to control the flow of said additive through said flow control passage;

a second flow control passage connected in series with said first-mentioned flow control passage and joined thereto by a mixing chamber;

a second inlet passage connected to said second flow control passage for supplying a second fuel additive fluid;

a second tapered valve seat formed within said second flow control passage;

a second flared valve control member coupled to said control rod in series with said first flared control member and positioned in said mixing chamber relative said second valve seat;

said first flared control member positioned in said mixing chamber in a back-to-back relationship with said second flared control member;

wherein a decrease in pressure in said chamber decreases the flow of said first-mentioned fuel additive fluid while simultaneously increasing the flow of said second fuel additive fluid and an increase in pressure in said chamber increases the flow of said first-mentioned fuel additive fluid while simultaneously decreasing the flow of said second additive fluid.

4,286,551

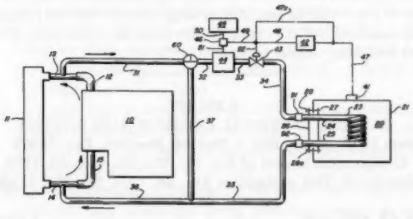
TEMPERATURE CONTROL SYSTEM FOR AUTOMOTIVE STORAGE COMPONENTS

James E. Blitz, 2832 Ross St., Highland, Ind. 46322

Filed Jan. 28, 1980, Ser. No. 115,996

Int. Cl.³ F01P *1/06, 3/12*

U.S. Cl. 123—41.31 **7 Claims**



1. A system for controlling the temperature of the contents of a storage vessel integral with an automotive transport system, said automotive transport system including a fluid-cooled internal combustion engine, during periods when said internal combustion engine is not in operation, comprising:

(a) a storage tank, having two end sections;

(b) a generally coiled length of pipe, having two end sections, disposed within said tank, each pipe end section sealably inserted through a common tank end section, and fitted, externally to said tank end section, to receive conduit couplings;

(c) two conduit means, each having two ends, each coupled at a first end to a respective pipe end section, the first conduit means having interposed along its length heating and pumping means and coupled at a second end to an inlet fluid coolant line, the second conduit means coupled at a second end to an outlet fluid coolant line, said fluid coolant lines being normally in communication with the internal combustion engine;

(d) temperature sensing means attached to said storage tank;

(e) valve means, inserted in the first conduit means, operable responsively to the temperature sensing means;

(f) an external electrical power source for operating said heating and pumping means and valve means;

(g) a three-way cut-off valve positioned at the junction of said inlet fluid coolant line, and said second end of said first conduit means; and

(h) by-pass conduit means connecting the cut-off valve to the outlet fluid coolant line; whereby the fluid coolant can be optionally diverted from passage through the internal combustion engine, heated and pumped in response to the power source and temperature sensing means through at least the respective pipe coils and conduit means, to control and maintain the temperature of the contents of the storage vessel.

4,286,552

VARIABLE COMPRESSION RATIO INTERNAL COMBUSTION ENGINE

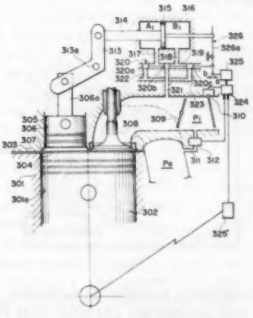
Saburo Tsutsumi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 9, 1979, Ser. No. 10,918

Claims priority, application Japan, Feb. 10, 1978, 53-14308

Int. Cl.³ F02B *75/36*

U.S. Cl. 123—48 AA **3 Claims**



1. A reciprocating piston internal combustion engine having an engine cylinder, comprising:

a piston reciprocally movable disposed in the cylinder to define a combustion chamber between a crown of said piston and a cylinder head;

means for varying the clearance volume of the combustion chamber, when actuated; said varying means including a small cylinder formed in the cylinder head, and a small piston in said small cylinder, the crown of said small piston defining a space in the small cylinder, said space forming part of the combustion chamber, said small piston being smaller in diameter than the engine cylinder;

means for detecting the charging efficiency of a charge inducted into the combustion chamber, said detecting means including means for determining the charging efficiency by sensing the amount of fluid to be charged into the combustion chamber and sensing an engine operating parameter, said determining means including an air flow sensor for sensing the flow amount of fluid to be inducted into the combustion chamber, an engine speed sensor for sensing engine speed, and EGR gas flow sensor for sensing the flow amount of EGR gas passing through an EGR passage connecting an intake passage and an exhaust passage through which exhaust gas from the combustion chamber is discharged out of the combustion chamber, and a control circuit for determining the charging efficiency in accordance with the information signals from said air flow sensor, said engine speed sensor and said EGR gas flow sensor to generate command signals,

means for modifying intake vacuum in accordance with the charging efficiency detected by said detecting means, said modifying means being operated in response to the command signals from said control circuit of said detecting means; and

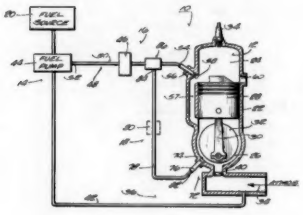
means for controllably actuating said varying means in response to the modified intake vacuum by said modifying means, said actuating means including a hydraulic piston slidably disposed in a cylinder to separate the interior of the cylinder into first and second chambers, the first and second chambers being communicable with an intake passage through which intake air is inducted into the combustion chamber in order that the first and second chambers are selectively supplied with intake vacuum in the intake passage, and a connecting mechanism for so connecting said hydraulic piston with said small piston that the volume of said space in said small cylinder varies with the movement of said hydraulic piston.

4,286,553

INTEGRATED FUEL PRIMER AND CRANKCASE DRAIN SYSTEM FOR INTERNAL COMBUSTION ENGINE

Gene F. Baltz, Lake Villa, and Chester G. DuBois, Zion, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 25, 1979, Ser. No. 60,285
Int. Cl.³ F02M *1/16*; F02B *33/04*
U.S. Cl. 123—187.5 R **25 Claims**



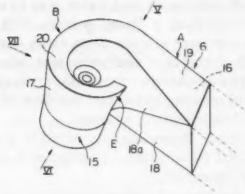
1. An engine comprising a combustion chamber, a crankcase extending from said combustion chamber, first fuel delivery means communicating with said combustion chamber and adapted for connection to a fuel source, said first fuel delivery means being operative for introducing fuel from the fuel source into said combustion chamber, second fuel delivery means communicating with said combustion chamber and adapted for connection to a fuel source, said second fuel delivery means being operative for introducing fuel into said combustion chamber in addition to the fuel introduced by said first fuel delivery means, collector means communicating with said crankcase for accumulating residual fuel from said crankcase, third fuel delivery means communicating with said collector means and said combustion chamber and operative for supplying residual fuel from said collector means to said combustion chamber, first control means connected to said second fuel delivery means for selectively operating said second fuel delivery means to introduce fuel into said combustion chamber, and second control means connected to said second fuel delivery means and said third fuel delivery means for blocking the supply of residual fuel by said third fuel delivery means during operation of said second fuel delivery means to introduce fuel into said combustion chamber.

4,286,554

INTAKE SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Takamitsu Okamoto, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Aug. 30, 1979, Ser. No. 71,372
Claims priority, application Japan, Jun. 25, 1979, 54-79039
Int. Cl.³ F01L *3/00*
U.S. Cl. 123—188 M **10 Claims**



1. An internal combustion engine comprising a cylinder head partially defining a combustion chamber, said cylinder head comprising at least one helically-shaped intake port to direct intake gas to said chamber, said intake port comprising a helical portion having an open outlet end and an intake valve arranged at said outlet end, said helical portion being defined by an upper wall and a peripheral side wall which extends circumferentially about the axis of said intake valve, and a substantially straight inlet passage portion tangentially connected to said helical portion and having an open inlet end, said inlet passage portion being defined by an upper extension of said upper wall, a bottom wall, a first side wall located near the axis of said intake valve, and a second side wall arranged at a position more remote from the axis of said intake valve than the first side wall and connected to the peripheral side wall of said helical portion, said first side wall comprising a portion sloped inwardly toward said second side wall, said side wall increasing in width toward said helical portion and intersecting said upper wall closer to said second side wall in a region closer to said helical portion than in a region closer to said inlet end to reduce the cross-sectional size of the inlet passage portion adjacent to said helical portion and to deflect at least part of said gas toward said combustion chamber; and an intake manifold comprising a manifold inlet portion and a substantially straight manifold outlet portion connected to, and in line with, the inlet end of said inlet passage portion, the ratio of the sum of the length of said inlet passage portion and the length of said manifold outlet portion to the cross-sectional area of said inlet end being above 0.7 cm^{-1}.

4,286,555

ROTARY INTERNAL COMBUSTION ENGINE

Robert H. Williams, Rte. 2, Box 44, Bandera, Tex. 78003

Continuation-in-part of Ser. No. 956,206, Oct. 30, 1978, abandoned. This application Apr. 18, 1979, Ser. No. 30,993
Int. Cl.³ F02B *53/00*
U.S. Cl. 123—228 **3 Claims**

1. A rotary internal combustion engine having a four-phase cycle of intake, compression, expansion, and exhaust in each revolution of the engine shaft, said engine comprising:

a stator with a cylinder bore enclosed between end walls;

a power shaft in bearings journaled in said end walls and concentric with said cylinder bore;

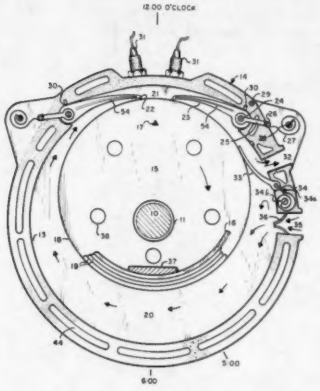
an eccentric annular rotor keyed to said power shaft and positioned approximately midway between said end walls;

an annular piston coextensive with said end walls fitted on said eccentric rotor and concentric therewith, said piston and said rotor having a common eccentric head with said piston head making tangential sealing engagement with said cylinder substantially throughout said cycle;

a first abutment having a first end pivotally secured to said stator near 10:00 o'clock and a second end free to project clockwise into said cylinder space far enough to make tangential, sealing engagement with the face of said piston in all positions of said piston;

a second abutment having a first end pivotally secured to said stator near 2:00 o'clock and a second end free to project counter clockwise into said cylinder space, means for maintaining sealing engagement of said second abutment with the face of said piston and means for removing said sealing engagement when the piston is near the 5:00 o'clock position;

both first and second abutments making sliding, sealing



engagement with both of said end walls and said piston to form a combustion-expansion chamber for confining a fuel charge throughout an expansion stroke and exerting pressure against said piston to cause said eccentric rotor to rotate;

a combustion chamber comprising a shallow arcuate cavity in said stator centered near 12:00 o'clock and opening into and combining with said expansion chamber;

a suction chamber and a compression chamber, said suction chamber being the space behind said traveling piston head and said compression chamber being the space forward of said traveling piston head;

an air inlet port in said stator positioned in the vicinity of 3:00 o'clock, said port fitted with a one-way valve to admit air into said suction chamber as movement of said piston head generates a suction;

means for injecting a charge of fuel into said combustion chamber and means for firing said fuel charge in timed relation to the position of said piston head;

exhaust means for expelling spent gases from said combustion-expansion chamber at the end of the power stroke, said exhaust means positioned after 2:00 o'clock and before 3:00 o'clock in said stator.

4,286,556

ARRANGEMENT FOR AIR-COMPRESSING DIRECT-INJECTION INTERNAL COMBUSTION ENGINES

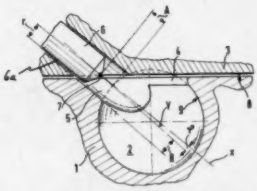
Alfred Neitz, Röthenbach; Hans Pickel, and Nunzio D'Alfonso, both of Nuremberg, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Sep. 26, 1979, Ser. No. 79,155

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1978, 2842457

Int. Cl.³ F02B 3/00

U.S. Cl. 123—279 **2 Claims**



1. An arrangement for air-compressing, direct-injection internal combustion engine having means for the ignition of fuel for said engine, at least one piston and a pertaining cylinder having a pertaining cylinder head, said arrangement comprising:

a combustion chamber provided in said at least one piston, said combustion chamber having the shape of a body of rotation with a predetermined maximum diameter, having a constricted throat, and being adapted to accommodate movement of air therein about its longitudinal central axis;

injector means operatively connectible to said engine for injecting a fuel adapted to form a film on the wall of said combustion chamber in one of the upper speed and load ranges of said combustion engine while at engine idling and in one of the lower speed and load ranges an at least nearly complete direct fuel-air mixing occurs, whereby the fuel injection pressure is maintained at least nearly constant at the injector means fuel outlet over the full operating range of said engine; and

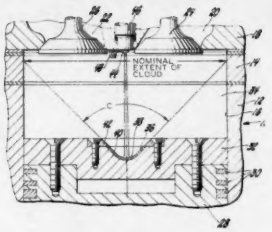
means for communicating said injector means and said combustion chamber with one another, said means including a recess in said at least one piston, the point of intersection of the longitudinal central axis of a stream of fuel being emitted by said injector means with that plane of the pertaining cylinder head which limits the upward movement of said at least one piston being positioned within an imaginary circle the center of which is coincidental, when viewed in plan and when said at least one piston is in its upper to center position, with the center of said greatest diameter of said body of rotation on that plane which contains said greatest diameter and is parallel to said plane of the pertaining cylinder head which limits the upward movement of said at least one piston, said imaginary circle having at most a 10% greater diameter than said greatest diameter of said combustion chamber, with the injector means fuel outlet being adapted to be located at a distance from said combustion chamber in said communicating means, said distance corresponding to up to about 30% of the greatest diameter of said body of rotation, said recess being a semicircular recess arranged in said constricted throat of said combustion chamber, with the longitudinal central axis of said recess extending at an angle of from about 3° to about 15°, with the selected angle having its apex at said injector means fuel outlet, with one line defining said angle being said longitudinal central axis of a jet of fuel and the other line defining said angle being the longitudinal central axis of said recess and having a steeper inclination than that longitudinal central axis of a jet of fuel.

4,286,557

TARGET INJECTION STRATIFIED CHARGE SPARK IGNITION ENGINE

Edward D. Klomp, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 21, 1979, Ser. No. 77,842
Int. Cl.³ F02B *17/00*
U.S. Cl. 123—298 **3 Claims**



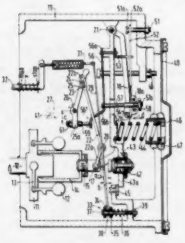
1. A stratified charge spark ignition internal combustion engine having at least one closed end cylinder with a piston reciprocable therein, the piston having a closed end wall opposing and defining with the cylinder closed end a variable volume combustion chamber, intake and exhaust means connecting with the combustion chamber, a fuel injection nozzle carried in the closed end of the cylinder and arranged to spray a jet of fuel against the piston closed end near the cylinder central axis, and a target recess at the piston end wall and forming a surface of revolution about an axis nominally aligned with the fuel spray jet, said target recess being configured to receive the fuel jet centrally thereof and to spread and redirect the fuel around and away from the axis in a spray generally centered within the combustion chamber to form a richcore stratified fuel-air charge upon mixture with an air charge in the chamber, and a spark plug disposed in the combustion chamber within the rich core zone of the stratified charge.

4,286,558

CENTRIFUGAL RPM GOVERNOR FOR FUEL INJECTED INTERNAL COMBUSTION ENGINES, ESPECIALLY AN IDLING AND FINAL RPM GOVERNOR FOR DIESEL VEHICLE ENGINES

Ilija Djordjevic; Ernst Ritter, both of Stuttgart, and Thomas Lang, Schwäbisch Hall, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 21, 1979, Ser. No. 50,584
Claims priority, application Fed. Rep. of Germany, Jan. 4, 1979, 2900198
Int. Cl.³ F02D *1/04*
U.S. Cl. 123—368 **11 Claims**



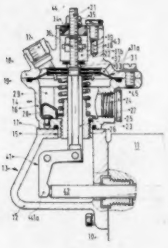
1. A centrifugal rpm governor for fuel injected internal combustion engines including a housing, comprising an intermediate lever which is coupled with the supply quantity adjustment member of the injection pump which is engaged by both a control member moved by means of flyweights in accordance with rpm and a setting member which is pivotable for the purpose of arbitrary variation of the supply quantity, said governor further including a force transmitting lever which contacts a fixed stop attached to the housing, under the prestressing force of a main control spring, with which said force transmitting lever the control member comes into effective contact after covering an idling sleeve path against the force of an idling spring, further wherein said force transmitting lever is provided with an additional idling spring, further wherein the force of said additional idling spring is made partially ineffective by a thrust member that cooperates with said setting member when said setting member is pivoted by means of a service lever about a pivotal axis to advance to a full-load position, said thrust member comprising an adjustable thrust screw that is positioned securely on said setting member at a radial distance (c) from said axis of said service lever.

4,286,559

PNEUMATIC DIAPHRAGM CONTROL MEMBER FOR A FUEL INJECTION DEVICE FOR INTERNAL COMBUSTION ENGINES

Ernst Ritter; Reinhard Schwartz; Rolf Müller, and Martin Böhm, all of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 11, 1979, Ser. No. 56,665
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1978, 2837964
Int. Cl.³ F04B *49/00*
U.S. Cl. 123—383 **4 Claims**



1. An adjustable pneumatic diaphragm control member for a fuel injection device for an internal combustion engine comprising:

a housing for connection with a fuel injection pump;

a control member connected with said housing;

a cover secured to said control member;

a control diaphragm clamped between said control member and said cover thereby separating the area within said cover from the area within said control member;

an axially adjustable bushing secured in said control member on the side thereof which is connected to said housing;

a push rod coaxially secured to said control diaphragm at one end and extending through said adjustable bushing into said housing;

a resetting spring coaxially with said push rod and said bushing and situated between a shoulder on said bushing and said control diaphragm for forcing said diaphragm upwardly; said resetting spring being adjustable by rotation of said bushing in said control member;

a push rod extension secured to one end of said push rod in axial alignment with said push rod and extending from said control diaphragm into said cover,

an axially adjustable stop member adjustably secured in said cover in axial alignment with said push rod extension which coacts with said push rod extension for adjustment of the upward movement of said diaphragm,

an adjustable counter-stop means coaxially secured on said

push rod extension and adjustable axially along said push rod extension,

an end stop means rigidly mounted in said cover adjacent to said control diaphragm, said end stop means coacting with said adjustable counter stop to stop the downward movement of said diaphragm against said resetting spring when said counter stop contacts said end stop spring,

inlet means in said cover for admitting pneumatic pressure into said cover above said control diaphragm, and

a means secured in said housing with one end relative to said push rod for operating a control rod of an injection pump in accordance with pneumatic pressure admitted through said inlet means above said control diaphragm.

4,286,560

METHOD AND APPARATUS FOR CONTROLLING AN IGNITION TIMING

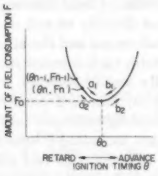
Yasuo Sagisaka, Kariya; Toshio Kondo, Anjo, and Akio Kobayashi, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 26, 1980, Ser. No. 134,335

Claims priority, application Japan, Mar. 28, 1979, 54-36470

Int. Cl.³ F02P *5/04*

U.S. Cl. 123—417 **9 Claims**



1. An apparatus for controlling a timing of ignition spark to be supplied to ignite a mixture of air and fuel supplied to an internal combustion engine comprising:

means for sensing operating conditions of said engine;

means for sensing an amount of fuel supplied to said engine;

means for storing, in a nonvolatile manner, a group of correction values in respective addressable storage locations;

means for computing a timing of ignition spark, so that a fuel efficiency relative to the output torque of said engine is maximized, said computing means including:

means for determining a basic timing of an ignition spark in accordance with said operating conditions sensed currently;

means for discriminating whether said operating conditions sensed currently are close to or apart from said operating conditions sensed precedingly, said discriminating means providing first and second outputs respectively indicating that the former is close to or apart from the latter;

means for discriminating, in response to said first output, whether said amount of fuel sensed currently in larger or less than said amount of fuel sensed precedingly,

means for determining a new correction value in accordance with the discrimination result of said latter discriminating means and with one of said correction values stored in one of said storage locations addressed in correspondence with said operating conditions sensed currently, said new correction value being more effective to maximize said fuel efficiency than said one of said correction values is and being stored in said one of said storage locations in place of said one of said correction values, and

means for correcting said basic timing of ignition spark by said new correction value, said correcting means correcting the same by another one of said correction values stored in another one of said storage locations addressed in correspondence with said operating conditions sensed currently in response to said second output; and

means for supplying said engine with an ignition spark at said corrected timing of ignition spark.

4,286,561

INTERNAL COMBUSTION ENGINE INTAKE SYSTEM HAVING JET-PRODUCING NOZZLE IN INTAKE PORT

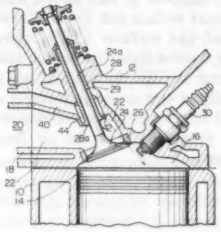
Saburo Tsutsumi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 20, 1978, Ser. No. 961,924

Claims priority, application Japan, Nov. 21, 1977, 52-155360[U]

Int. Cl.³ F01N *3/10*

U.S. Cl. 123—432 **7 Claims**



1. An intake system of an intenal combustion engine, comprising: an induction passage, an intake port as an endmost portion of said induction passage adjoining a combustion chamber of the engine, a throttle valve installed in said induction passage upstream of said intake port, an intake valve for periodically establishing communication between said intake port and said combustion chamber according to the engine cycle, said intake valve having a stem extending through said intake port and slidably passing through a cylindrical valve guide fixedly inserted into a cylinder head, a fuel nozzle opening into said induction passage at a section upstream of said intake valve, an auxiliary induction passage arranged to induct a gas into said intake port by the action of vacuum created in said intake port, at least a terminal portion of said auxiliary induction passage being formed in said cylinder head, said guide member defining a nozzle which serves as the terminal of said auxiliary induction passage and as a valve member for controlling admission of auxiliary gas and opens into said intake port at a location close to an end of said valve guide to jet said gas into said intake port in a direction towards said combustion chamber, said auxiliary induction passage extending to said nozzle without entering the inside of said valve guide, an endmost portion, which is adjacent said nozzle, of said terminal portion of said auxiliary induction passage being in the form of a generally annular passage the inside of which is defined by a cylindrical outer surface of said valve guide, upstream of said generally annular passage said auxiliary induction passage being distant from said valve guide.

4,286,562

ENGINE CHARGE FORMING APPARATUS

Donald D. Stoltman, Henrietta, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 7, 1979, Ser. No. 18,434

Int. Cl.³ F02M *39/00, 69/04*

U.S. Cl. 123—454 **4 Claims**

1. Charge forming apparatus for an engine having an induction passage, including parallel throttle bore and bypass portions each opening from an air inlet to a manifold and a throttle in said throttle bore portion between said inlet and said manifold for varying the effective area of said induction passage, wherein the rate of air flow for any selected position of said throttle and for an established pressure in said inlet varies substantially uniformly with the pressure in said manifold

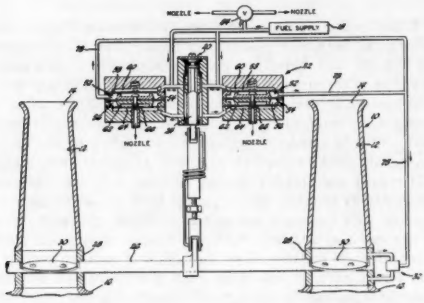
when the manifold pressure is greater than about one-half the inlet pressure and wherein the air flow rate does not vary uniformly with the manifold pressure when the manifold pressure is less than about one-half the inlet pressure, and also having means for delivering fuel through a fuel passage to a pair of fuel nozzles, said apparatus comprising:

means in said bypass portion for creating a pressure signal which varies substantially uniformly with the air flow rate both when the manifold pressure is less than about one-half the inlet pressure and when the manifold pressure is greater than about one-half the inlet pressure,

a hollow cylindrical sleeve having a pair of symmetrically disposed helical slots defining a pair of metering orifices in said fuel passage respectively opening to said nozzles,

a metering rod disposed in said sleeve, said rod having a cylindrical outer surface and a pair of symmetrically disposed beveled end surfaces which intersect said outer surface along curved lines that overlie said slots,

means interconnecting said throttle and said rod for moving said rod axially in said sleeve to traverse said lines along said slots and thereby provide fuel metering orifice areas substantially proportional to the air flow area of said induction passage,



a pressure regulator controlling fuel flow through said fuel passage to said nozzles for maintaining the pressure difference across said metering orifices substantially proportional to said pressure signal,

means adapted for adjusting the position of said rod relative to the position of said throttle and thereby axially adjusting the position of said rod in said sleeve to establish the minimum fuel flow rate through said passage to said nozzles and further adapted for rotationally adjusting the position of said rod in said sleeve to establish the maximum fuel flow rate through said passage to said nozzles,

whereby fuel flow through said fuel induction passage is controlled substantially in proportion to air flow through said air induction passage,

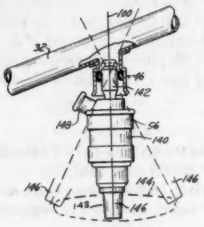
and means for modifying said pressure signal in response to selected engine operating conditions to create a modified pressure signal which differs from the inlet pressure by an amount that also is substantially proportional to the square of the air flow rate both when the manifold pressure is less than about one-half the inlet pressure and when the manifold pressure is greater than about one-half the inlet pressure, whereby the proportion of fuel flow to air flow may be varied during selected engine operating conditions.

4,286,563

FUEL RAIL FOR AN ENGINE

Magdi M. Fahim, Rochester; Victor J. Nowak, Royal Oak, and Nagui R. Matta, Huntington Woods, all of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Mar. 19, 1979, Ser. No. 21,663
Int. Cl.³ F02M *55/00*; B02B *1/14*
U.S. Cl. 123—469 **3 Claims**



1. An apparatus for delivering fuel to at least one fuel injector of an engine comprising:

fuel rail means of unitary construction including a fuel carrying conduit for receiving fuel input thereto and for distributing the fuel to the at least one injector;

a connector affixed directly to and in fluid communication with said fuel rail means and the at least one fuel injector, one associated with each injector having receiving means for telescopically and swivela[illegible] receiving a portion of the at least one injector and attachment means for connecting said receiving means to said fuel rail means;

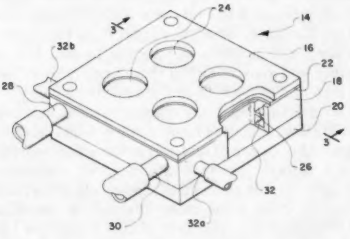
said receiving means including a base end having a passage therein, rigidly affixed to said fuel rail means, an open end opposite thereto and a wall joining said base end to said open end, said receiving means further incuding an o-ring adapted to seat upon said base end, wherein said wall is sized to loosely receive an end of the at least one injector and wherein said o-ring provides a fluid tight seal between said wall and the received end of the at least one injector and provides a vertex for permitting the pivoting motion of the at least one injector relative to said wall.

4,286,564

SYSTEM FOR PREHEATING FUEL

Richard Van Tuyl, Rte. 1, Box 81, Pikeville, N.C. 27863

Filed Nov. 21, 1979, Ser. No. 96,536
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—545 **9 Claims**



1. A system for improving performance and fuel economy of an internal combustion engine having a carburetor for directing an air-fuel mixture to the engine, a fluid cooling system for cooling said engine, and a fuel supply line for directing fuel from the fuel pump to said carburetor, said system comprising: a heat exchanger plate assembly mounted between; said engine and said carburetor and including opening means therein for

allowing the air-fuel mixture from the carburetor to pass therethrough into the engine; said heat exchanger plate assembly having a wall extending generally around said opening means; a first compartment formed in said exchanger plate assembly and disposed generally exteriorly of said opening means and extending therearound, said first compartment having an inlet and an outlet operatively connected to said engine cooling system for circulating relatively hot coolant fluid through said first compartment, thereby transferring heat from the engine coolant fluid to the exchanger plate assembly and to the air-fuel mixture passing through said opening means formed within said exchanger plate assembly; a second compartment formed in said exchanger plate assembly generally exterior of said opening means and which generally extends around said opening means; said second compartment lying adjacent said first compartment such that heat associated with the coolant fluid passing therethrough may be readily transferred to said second compartment; inlet and outlet means associated with said second compartment and operatively connected to said fuel line for routing fuel through said secondcompartment prior to its entry into said carburetor such that heat associated with said engine coolant fluid passing in said first compartment may be transferred to the gas being routed through said second compartment, whereby the heat from said engine coolant fluid acts to not only heat the gas prior to entry into the carburetor but also heats the final air-fuel mixture passing from the carburetor.

4,286,565

ENGINE CONTROL INSTALLATION

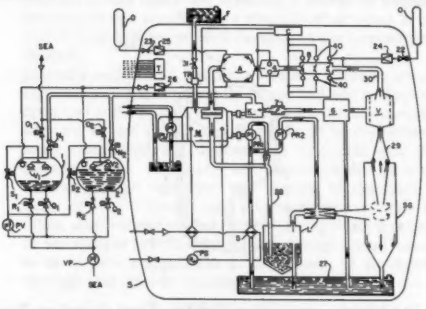
Giunio G. Santi, Milan, Italy, assignor to S.S.O.S. Sub Sea Oil Services S.p.A., Milan, Italy

Filed Jul. 30, 1979, Ser. No. 61,992

Claims priority, application Italy, Aug. 4, 1978, 26473 A/78; Feb. 9, 1979, 20060 A/78 1978.

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—568 **1 Claim**



1. An internal combustion engine installation wherein said engine has an intake for receiving an oxidizible fuel and a gas intake for receiving an oxidizing fuel gas and an exhaust at which the products of combustion, including carbon dioxide gas, are discharged along with some unburned oxidizing fuel gas, said installation including

closed circuit conduit means interconnecting said exhaust and said gas intake for receiving said gases at said exhaust and for feeding back a portion of said received gases to said gas intake, said conduit means including centrifugal separator means for dividing said received gases into two partial streams, one of which has a higher concentration of O_2 than did the received gases and the other of which has a higher concentration of CO_2 than did the received gases, said conduit means delivering said one partial stream to said gas intake.

4,286,566

ENGINE SYSTEM

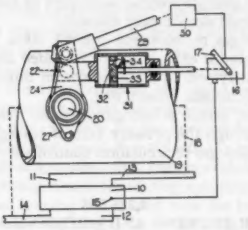
William S. May, High Wycombe, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Apr. 14, 1980, Ser. No. 139,900

Claims priority, application United Kingdom, Jun. 8, 1979, 19984/79

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—569 **4 Claims**



1. An engine system comprising a compression ignition engine, a fuel pump for supplying fuel to the engine in timed relationship therewith, a manually operable control member for controlling the rate at which fuel is supplied by the pump in use, conduit means through which exhaust gases can flow from the engine exhaust to the air inlet thereof, valve means for controlling the flow of exhaust gas through said conduit means, control means for determining the setting of said valve means whereby in use, as the rate at which fuel is supplied to the engine increases the quantity of exhaust gas passing to the air inlet is reduced, and means operable upon movement of said control member in a direction to increase fuel, to effect immediate operation of said valve means to reduce the amount of exhaust gas flowing to the air inlet.

4,286,567

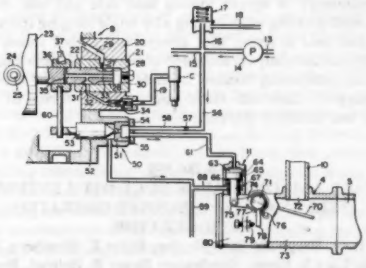
EXHAUST GAS RECIRCULATION CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Tatehito Ueda, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 27, 1979, Ser. No. 107,519

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—569 **6 Claims**



1. In a diesel engine, comprising an exhaust system, an inlet system, and an exhaust gas recirculation system, a device which is the combination of:

a fuel injection pump which comprises a movable fuel amount determining element, the position of which regulates the amount of fuel provided for injection by the fuel injection pump;

a conversion device, comprising:

a fixed orifice, to the upstream side of which is supplied a substantially constant fluid pressure;

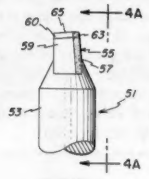
a fluid passage downstream of the fixed orifice;
a pressure takeoff passage branching from the fluid passage; and
a variable orifice downstream of the fluid passage whose effective opening area is varied according to the movement of the fuel amount determining element;
fluid flowing from the upstream side of the fixed orifice through it, through the fluid passage, and through the variable orifice, in that order, the pressure of fluid at the point where the pressure takeoff passage branches from the fluid passage varying according to the position of the fuel amount determining element;
an exhaust gas recirculation control valve, which controls the amount of exhaust gas recirculated from
the exhaust system to the inlet system through the exhaust gas recirculation system; and,
an actuator, which is energized by the fluid pressure supplied through the pressure takeoff passage, and operates the exhaust gas recirculation control valve.

4,286,568

TOOL FOR TRUEING AND DRESSING A GRINDING WHEEL

Rangachary Komandure, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 26, 1979, Ser. No. 78,941
Int. Cl.³ B24B *53/12*
U.S. Cl. 125—11 R **5 Claims**



1. A tool for trueing and dressing a grinding wheel at a negative rake angle, having a dressing edge consisting essentially of a side dressing edge angle ranging between 30° and 75° wherein the side dressing edge is at least about 0.5 millimeter in length, an end dressing edge angle ranging between 5° and 30° wherein the end dressing edge is at least about 0.5 millimeter in length, and a straight secondary dressing edge of at least about one millimeter in length joining said side and end dressing edges, said dressing edge having a lip angle ranging from 90° to 120°, and said dressing tool comprising a tool shank and a polycrystalline compact mounted at one end of said shank, said compact comprising bonded crystals selected from the group consisting of diamond, cubic and wurtzite forms of boron nitride and mixtures thereof.

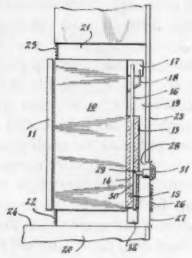
4,286,569

INTAKE AND DISCHARGE DUCT WITH EXTERNAL TERMINAL FOR A BURNER-OPERATED REFRIGERATOR

Ernst L. A. Bergman, Saltsjöbaden; Peter E. Blomberg, Stockholm; Lars S. Enger, Bandhagen; Bengt R. Reistad, Bromma, and Sonny O. Wallgren, Ekerö, all of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Feb. 4, 1980, Ser. No. 118,111
Claims priority, application Sweden, Feb. 2, 1979, 7900914
Int. Cl.³ F24C *3/00*; F25B *15/00*; B60H *3/04*
U.S. Cl. 126—85 B **4 Claims**

1. In an assembly with a burner-operated refrigerator in a house trailer or the like, said trailer being provided with a service door in an external wall of said trailer adjacent to said assembly, control devices for said refrigerator, a sealed combustion system in the interior of said trailer comprising a boiler pipe having insulation at least about a part thereof, an air intake in said trailer wall, an air conduit from said air intake to said burner, a flue pipe connected to said burner and having heat insulation thereabout, said flue pipe having a heat conductive connection for an associated part of the refrigerator in which refrigerant is expelled and conducted to a gas outlet through said wall of said trailer, the improvement comprising: at least a part of said flue pipe located above said connection on a level



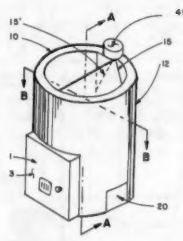
below the upper edge of the door provided with a portion that is bent and directed rearwardly out of said heat insulation and is connected to said gas outlet, an air conduit also located on a level below the upper edge of said door and provided with a bent part directed rearwardly and connected to said air intake, and wherein both said air intake and gas outlet are located in said door, and the top of said service door being below the top of said boiler insulation.

4,286,570

EFFICIENCY HEATER

Vesa M. Kuosmanen, 30 High St., Acton, Mass. 01720

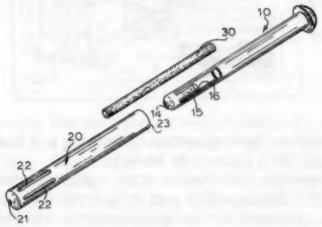
Filed Mar. 30, 1978, Ser. No. 891,904
Int. Cl.³ F24H *3/00*
U.S. Cl. 126—99 R **3 Claims**



1. In a heater: a combustion chamber of tent-shaped configuration, a pair of joined and slanted walls on said combustion chamber, said combustion chamber extending the entire vertical height of heater, an outer jacket defining the outer configuration of said heater, the entire surface of each of said slanted walls presenting a medium of heat exchange throughout their entire exterior surfaces, cut away portions located in the base areas of said outer jacket to provide ingress for clean air at the base edge on each of said slanted walls, said base edges terminating at the lower limit of said outer jacket and adjacent to said openings, thereby presenting to the clean air entering immediate heating and immediate upward convection, additional heating surfaces for transmitting heat to the clean air, said means comprising an inner jacket located inside said outer jacket in the upper area of said heater and forming with said outer jacket a residual burning chamber, means for sealing the interior of said combustion chamber and the interior of said residual burning chamber from the clean air being heated, said

last named means comprising: edges on said slanted walls, these edges being designated for convenience, a first edge, a second edge, and third and fourth edges, said first edge being an integral line throughout its length, and being secured throughout its length to the inner surface of said outer jacket and in sealed relationship therewith, said second edge having an upper segment cut away to form a shoulder and a lower segment, said lower segment being secured to the inner surface of said outer jacket and in sealed relationship therewith, each of said third and fourth edges having upper portions cut away, forming upper and lower segments, said last named upper segments being secured to said inner jacket and in sealed relationship therewith, said last named lower segments being secured to the inner surface of said outer jacket and in sealed relationship therewith.

4,286,571
KENSHIN HEATING INSTRUMENT
David P. J. Hung, 229-03 64th Ave., Bayside, N.Y. 11364
Filed Mar. 10, 1980, Ser. No. 128,432
Int. Cl.³ A61F *7/08*
U.S. Cl. 126—206 **9 Claims**



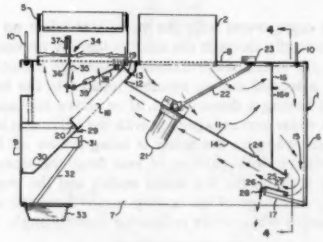
1. A hand-held, non-electrically powered heating instrument, comprising:

a generally cylindrical, hollow, elongated, metallic first element having means for mounting a charge of burnable fuel therein and also having a plurality of air vents at one end thereof and an air inlet opening at the opposite end thereof;

a generally cylindrical, hollow, elongated, metallic second element having a substantially closed end and an opposite open end and a plurality of air vents formed substantially adjacent to said closed end thereof, said second element being configured and dimensioned to permit said first element to be releasably and telescopically received therein through said open end thereof, so that said air vents of both elements may communicate with one another, said first and second elements being slidable relative to one another in both a rotatable and longitudinal manner so as to permit regulation of the amount of air flowing through said air inlet opening and through said vents.

4,286,572
VENTILATING HOOD
James A. Searcy, Florissant; Roger O. Zoellner, Kirkwood, and Ronald C. Hoffmann, Maryland Heights, all of Mo., assignors to Cambridge Engineering, Inc., Chesterfield, Mo.
Filed Mar. 8, 1979, Ser. No. 18,725
Int. Cl.³ F21C *15/08*; F23J *11/00*
U.S. Cl. 126—299 D **9 Claims**

1. A fume ventilating hood for use in conjunction with a heating apparatus or the like for attaining ventilation in the region upwardly of such an apparatus and for removing its generated fumes, comprising, a housing, said housing having at least front and side walls, a top structural means for the housing, said top structural means comprising the top wall of the apparatus, a supply inlet communicating with said housing for conveying fresh air to the same, and an exhaust outlet also communicating with the housing for removing the combined air and fumes from the region above the apparatus, a diverter means for the housing and interconnecting between the said inlet and outlet and being uniformly singularly planar in configuration and useful for directing the incoming fresh air towards the front of the housing, a rear support for the housing and connecting in proximity with the said exhaust outlet, a shallow filter held by the said rear support, said diverter means being inclined in its positioning within the hood, with the upper end of said diverter means being located in proximity with the rear support, while the lower end of said diverter means being disposed proximate the front of the said housing, a diffuser means interconnecting between the top wall of the apparatus and the approximate lower segment of the diverter means, said shallow filter being substantially less than one half of the length of the diverter means, the upper end of the diverter means terminating within the region directly in front of the said filter so as to provide for the unencumbered flow of the accumulated air and fumes directly into the exhaust outlet without any obstruction other than that provided by the said filter, and a deflecting means connecting approximately at the lower front of the housing and spaced from the lower edge of the diverting means and useful for redirecting the diverted incoming air directly towards the outlet disposed filter in



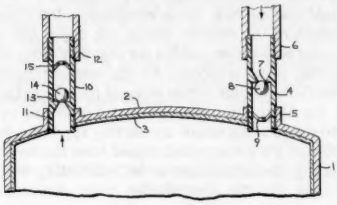
parallel flow with the underside of the uniformity singularly planar diverter means for creation of an air boundary layer therewith without generating any substantial vortexing of said air for its eventual exhausting of the now combined air and fumes from the said hood,

said deflecting means extends rearwardly from its connection with the lower end of the front wall and in a direction inclined substantially approximately towards the said filter, a second deflecting means arranged in proximity with the said first named deflecting means and forming an air space therebetween of substantially small dimensions than the space between the lower edge of the diverter means and said first deflecting means, said second deflecting means including a first part arranged substantially in parallel and upwardly of the first deflecting means, and a second integral part extending substantially downwardly for diverting a minor segment of air flowing therethrough in a direction downwardly of the hood, said second deflecting means being useful for directing said minor segment of the flowing air substantially downwardly for forming an inner shield in the front of the apparatus and for confinement of its heat thereby enhancing its attraction to the exhaust outlet of the hood.

4,286,573
WATER HEATER HEAT TRAP ASSEMBLY
Herbert W. Nickel, Germantown, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.
Continuation of Ser. No. 930,918, Aug. 4, 1978, abandoned. This application Feb. 4, 1980, Ser. No. 118,082
Int. Cl.³ F24H *1/00*
U.S. Cl. 126—362 **4 Claims**

1. A heat trap assembly preventing heat loss through thermal circulation in the piping systems connected to a hot water

storage vessel, which comprises a valve seat secured inside that portion of the piping system of the cold water inlet located on the outside of the vessel, a second valve seat secured inside that portion of the piping system of the hot water outlet located on the outside of the vessel, first stop means permitting passage of water therethrough disposed within the piping system of the cold water inlet longitudinally inwardly of the valve seat, and second stop means disposed in the piping system of the hot water outlet longitudinally outwardly of the valve seat, a first sealing member located in the cold water inlet and having a density of 0.95 or less and adapted to float in the water upwardly in engagement with the valve seat when no water is flowing inwardly through the inlet to thereby prevent loss of heat from the stored water outwardly through the cold water inlet, and a second sealing member located in the hot water outlet and having a density of 1.10 or above and adapted to sink in the water into engagement with the valve seat in the hot water outlet when no hot water is being drawn off from the vessel to thereby prevent loss of heat from the stored water outwardly through the hot water outlet, and the stop means preventing discharge of the sealing means from the inlet and outlet passages when water is flowing therethrough.

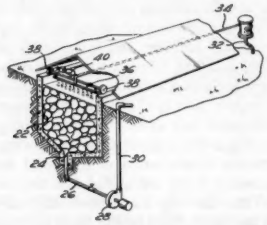


4,286,574

TRICKLE-TYPE THERMAL STORAGE UNIT

John J. Vrolyk, Northridge, and Ronald P. Pauckert, Canoga Park, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 3, 1980, Ser. No. 126,634
Int. Cl.³ F24H *7/00*; F24J *3/02*; F28D *13/00*
U.S. Cl. 126—400 **10 Claims**



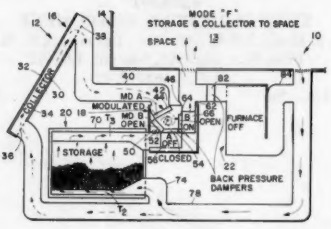
1. A thermal storage unit comprising:
containment means;
a quantity of particulate solid thermal storage medium disposed within said containment means;
a source of thermal transfer fluid;
thermal input means serving to heat said thermal transfer fluid;
distribution means movable to deliver said thermal transfer fluid to the upper surface of said thermal storage medium in a predetermined manner;
drainage means below said thermal storage medium for collecting said thermal transfer fluid;
thermal output means; and
transfer means selectably operable to transfer said thermal transfer fluid from said source through said thermal input means to said distribution means and from said drainage means to said thermal input means or to circulate said fluid through said thermal output means to said distribution means.

4,286,575

SOLAR HEAT SYSTEM

Timothy P. Gates, Cedar Springs, Mich., assignor to Jordan College, Cedar Springs, Mich.

Filed Dec. 4, 1978, Ser. No. 966,320
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—422 **6 Claims**



1. A solar air heating system comprising a collector and a storage unit for a space to be heated;
air propulsion and flow control apparatus comprising a chamber having a first port to be communicant with said space, a second port to be communicant with said storage unit and a third port to be communicant with said collector; a first propulsion unit and a first flow control valve for flow from said chamber to said space, a second propulsion unit and a second flow control valve for flow from said chamber to said storage unit, a third flow control valve for flow from said collector to said chamber, and a fourth flow control valve for flow from said storage unit to said chamber; said first propulsion unit constituting the sole propulsion source for air propelled from said collector and/or said storage unit through said chamber to said space; control means for said apparatus (a) for opening said third valve and activating said first propulsion unit for flow from said collector to said chamber to said space, (b) for opening said third valve and activating said second propulsion unit for flow from said collector to said chamber to said storage, (c) for opening said fourth valve and operating said first propulsion unit for flow from said storage to said chamber to said space, and (d) for opening said third valve and said fourth valve and activating said first propulsion unit for flow from said collector to said chamber and from said storage to said chamber for mixing and flow to said space.

4,286,576

SOLAR ENERGY THERMALIZATION AND STORAGE DEVICE

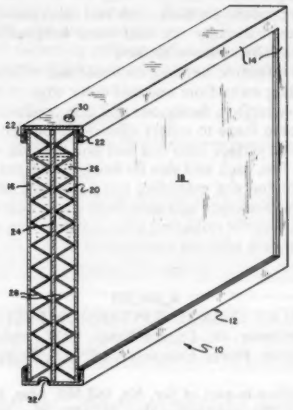
John F. McClelland, Ames, Iowa, assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 26, 1979, Ser. No. 61,321
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—428 **7 Claims**

1. A visually transparent, passive solar thermalization and thermal energy storage assembly comprising:
a first transparent substantially planar wall member,
a second transparent substantially planar wall member, the second member being substantially parallel to and spaced apart from the first member,

a semi-transparent substantially planar thermalization plate located between the wall members and substantially parallel to both,

sealing means between the first and second wall members for forming a liquid-tight chamber containing the thermalization plate,



a transparent, thermal energy storage liquid in the chamber and means for preventing convective heat transfer within said liquid, said means for preventing convective heat transfer consisting of a plurality of visually transparent, horizontal accordian pleated baffles positioned between the thermalization plate and each wall member.

4,286,577

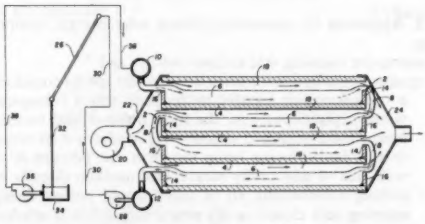
APPARATUS FOR CONTAINING LIQUID

Donald L. Spencer, Iowa City, and Patrick J. Melroy, Wellman, both of Iowa, assignors to The University of Iowa Research Foundation, Iowa City, Iowa

Filed Nov. 30, 1978, Ser. No. 965,362

Int. Cl.³ F24H *7/00*

U.S. Cl. 126—429 **11 Claims**



1. Apparatus for containing, storing and providing heat exchange with a body of liquid comprising,

a continuous tube which includes a plurality of vertically spaced reservoir sections for containing quantities of a primary liquid to be heated or cooled, each said reservoir section having at its opposite ends an inlet end and an outlet end,

liquid passages connecting said reservoir sections and extending downwardly from the outlet end of each reservoir section to the inlet end of a lower said reservoir section,

an overflow member at the upper end of each of said liquid passages for releasing liquid which exceeds the height of said overflow member into the liquid passage,

barrier means in intimate contact with and conformable to the upper surface of liquid in each of said reservoir sections, and,

means for flowing a gaseous medium laterally across said barrier means to remove heat from or add heat to the liquid in said reservoir sections.

4,286,578

SOLAR ENERGY ABSORBING PANEL

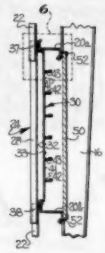
William H. McArthur, P.O. Box 236, Forest City, N.C. 28043

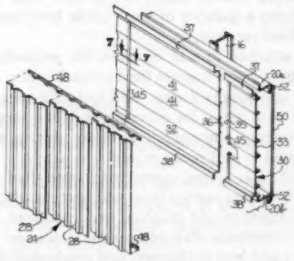
Division of Ser. No. 827,948, Aug. 26, 1977, Pat. No. 4,184,476.

This application Sep. 24, 1979, Ser. No. 78,227

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—429 **7 Claims**





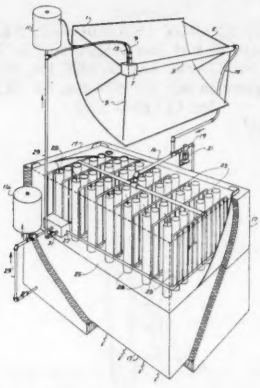
1. A panel adapted for absorbing solar radiation in a solar energy collector or the like and efficiently transferring the absorbed heat energy to an airstream moving thereover, and comprising a generally rectangular sheet of heat conducting material and having a generally planar first surface and an opposite surface, and opposite end edges and opposite side edges, said sheet being composed of a plurality of interconnected side by side sections, with each section extending between said end edges and including a planar medial portion and opposite sides, and with the adjacent sides of adjacent sections extending substantially perpendicularly from said planar medial portion and being contiguous and interconnected to each other to form parallel fins extending outwardly from the opposite surface of the sheet and between said opposite end edges, the outer sides of those sections adjacent each of the opposite side edges of the panel being offset in a common direction, and such that said offset sides are co-planar with each other and parallel to the plane of said first surface, and said panel further comprising slot means mounted along one of said end edges for receiving the other end edge of another like panel therein and such that a plurality of panels may be readily joined in an end-to-end arrangement and with said fins extending in a common direction, whereby the panel is adapted to transfer heat to air passing along said opposite surface in a direction parallel to said fins, and the panel may be readily fabricated from standard sized sections into a desired width.

4,286,579

CLOSED LOOP SOLAR COLLECTOR SYSTEM

Barry Johnston, 1622 Q St., NW., Washington, D.C. 20009

Filed May 30, 1979, Ser. No. 43,799
Int. Cl.³ F24J 3/02
U.S. Cl. 126—438 **15 Claims**



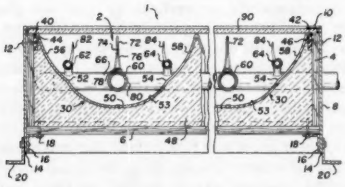
1. A closed loop solar collector system comprising:
a fluid receiver for collecting solar heat;
fluid supply means, connected to said fluid receiver, for supplying a quantity of vaporizable heat transfer fluid to said fluid receiver;
means, attached to said receiver, for precisely metering a quantity of heat transfer fluid in batches into said receiver from said supply means, said metering means including vapor vent means for exposing said fluid supply means to substantially atmospheric pressure during supplying of said fluid to said receiver; and
heat exchanger means, connected to said fluid receiver, for absorbing heat energy from said heat transfer fluid which is vaporized in said receiver, said vaporized heat transfer fluid condensing after releasing its latent heat of vaporization to said heat exchanger, said condensed fluid flowing, under pressure provided by said vaporized fluid entering said heat exchanger means, to said supply means.

4,286,580

SOLAR COLLECTOR

Elmo Sitnam, 2780 Mt. Seymour Pkwy., North Vancouver, British Columbia, Canada (V7H 1E9)

Filed Jun. 11, 1979, Ser. No. 47,064
Int. Cl.³ 124J 3/02
U.S. Cl. 126—438 **16 Claims**



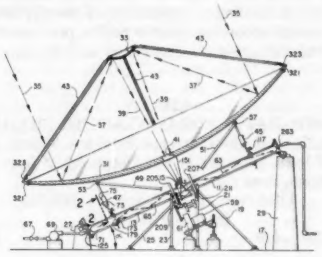
1. A solar collector comprising:
a central, elongate conduit for fluid;
a laterally concave, elongate reflective surface facing the central conduit, the central conduit extending centrally along the laterally concave surface, said surface having a shape to reflect solar radiation onto the channel conduit and two outer, longitudinal edges;
a central, elongate reflective fin connected to the central conduit and extending away from the laterally concave reflective surface, the central fin having a shape to reflect solar radiation striking the central fin onto the central conduit;
two side conduits for fluid, each said side conduit extending longitudinally near one said outer longitudinal edge of said laterally concave surface;
two side reflective surfaces, each said side reflective surface extending away from one said outer edge of the laterally concave surface, facing one said side conduit, and having a concave shape to reflect solar radiation that strikes said each side surface onto one said side conduit; and
two side fins, each said side fin being connected to one said side conduit and extending away from the laterally concave surface, each said side fin having a concave, reflective surface for reflecting solar radiation that strikes each side fin onto said one side conduit.

4,286,581

SOLAR ENERGY CONVERSION SYSTEM

John H. Atkinson, Jr., Laguna Beach, Calif., assignor to Advanced Solar Power Company (ASPCO), Newport Beach, Calif.

Continuation-in-part of Ser. No. 665,369, Mar. 10, 1976, abandoned. This application Dec. 26, 1978, Ser. No. 973,444
Int. Cl.³ F24J 3/02
U.S. Cl. 126—439 **59 Claims**



1. Apparatus for converting radiant solar energy, comprising:
means for focusing said radiant energy; and
opaque optically closed black body cavity means containing a transparent or translucent medium and a transparent window positioned near the focal point of said focusing means, the area of said window which admits solar energy to said cavity means being less than one percent of the wall area of said cavity means, said medium directly absorbing substantially all of said focused radiant energy entering said closed cavity means through said window, said cavity including means for repeatedly reflecting said radiant energy from the walls of said cavity to provide repeated transmission of said radiant energy through said medium.

4,286,582

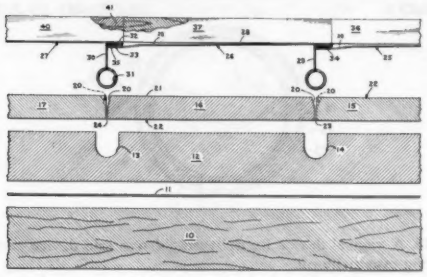
PREVENTION OF THERMAL BUILDUP BY CONTROLLED EXTERIOR MEANS AND SOLAR ENERGY COLLECTORS

Robert L. Nevins, High Point Mountain Rd., West Shokan, N.Y. 12494

Filed Sep. 10, 1979, Ser. No. 74,010
Int. Cl.³ F24J 3/02
U.S. Cl. 126—446 **2 Claims**

1. A solar energy system for a building comprising, a plural-

ity of interlocked flat solar energy collecting plate portions forming a portion of the building surface, each of said plates having a generally flat solar energy collecting surface, a folded over portion of the plate at one end of said collecting surface, said foled over portion being spaced from and parallel with one side of said flat solar energy collecting surface, a pair of overlapping reentrant folds formed in the plate, said reentrant folds being parallel with and spaced from another side of said flat solar energy collecting surface and at the end thereof that is opposite to said folded over portion, a web integral with said



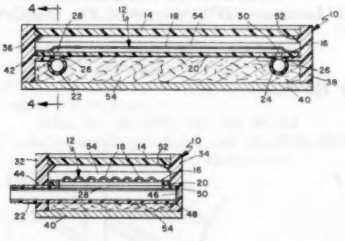
reentrant folds and generally perpendicular thereto to protrude past said flat solar energy collecting surface and said folded over portion, a further portion integral with said web for transferring collected solar heat from the solar energy collecting surface, tubes for removing solar energy from said collecting surfaces being in thermal contact therewith through said webs, a plurality of beams having notches formed therein in order to receive and support said tubes, and generally air-tight sheeting attached to said beams on sides thereof tha .e opposite to said notched sides in order to form a duct betw said plate portions, said beams and said sheeting.

4,286,583

SOLAR HEATER UNIT

David C. Dunn, Santee, and George C. Tweed, Jr., La Mesa, both of Calif., assignors to U.S. Elevator Corporation, Spring Valley, Calif.

Filed Jul. 2, 1979, Ser. No. 53,997
Int. Cl.³ F24J *3/02*; F28F *9/02*
U.S. Cl. 126—445 **2 Claims**



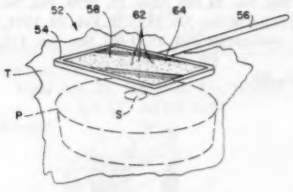
1. A solar heating unit, comprising:
a heater panel having a backing panel;
a channel plate sealed to one face of said backing panel, the channel plate having a plurality of spaced channels formed therein and extending between opposite ends, the channels having closed ends adjacent the opposite ends of the channel plate;
said backing panel having elongated slots therethrough extending perpendicularly to the channels at opposite ends and interconnecting the channels at their closed ends;
an inlet pipe longitudinally sealed to the backing panel along one of said slots and an outlet pipe longitudinally sealed to the backing panel along the other of said slots, said inlet and outlet pipes each having a longitudinal slot communicating with the respective slot in the backing panel and connecting each pipe to all of the channels;
a housing having side walls surrounding the heater panel;
said inlet and outlet pipes having end portions projecting through one of said side walls;
the wall opposite thereto having closed sockets in which the other ends of said inlet and outlet pipes are seated and sealed.

4,286,584

SEPTUM LOCATING APPARATUS

Edward J. Sampson, Concord, and Frank R. Prosl, Duxbury, both of Mass., assignors to Infusaid Corporation, Sharon, Mass.

Division of Ser. No. 916,129, Jun. 16, 1978, Pat. No. 4,222,374.
This application Oct. 15, 1979, Ser. No. 85,125
Int. Cl.³ A61B *19/00*
U.S. Cl. 128—1 R **2 Claims**



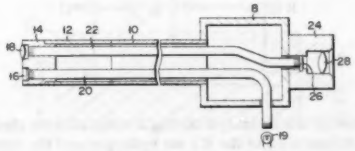
1. Apparatus for locating a septum in a prosthetic device implanted in a body comprising:
A. at least one permanent magnet mounted in the device in selected juxtaposition with the septum for emitting a magnetic field that extends exteriorly of the body and whose pattern defines the location of the septum, and
B. a passive nonelectric detector manipulable exteriorly of the body, said detector including
1. a container, and
2. a multiplicity of ferromagnetic particles in the container, the particles assuming a characteristic disposition in the container that corresponds to the magnetic field pattern produced by the said at least one implanted magnet thereby visually designating the precise location of the patient's body surface under which the septum is implanted.

4,286,585

BEND ANGLE CONTROL FOR ENDOSCOPE

Mototuga Ogawa, Chofu, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1979, Ser. No. 101,077
Claims priority, application Japan, Dec. 22, 1978, 53-158870
Int. Cl.³ A61B *1/06*
U.S. Cl. 128—6 **5 Claims**



1. An endoscope which comprises:

(a) a distal end portion containing an observation optical system;
(b) a flexible tube;
(c) a freely bendable section for connecting the distal end portion to the flexible tube;
(d) an optical transmission means for conducting an image picked up by the observation optical system to the eyepiece section of the endoscope;
(e) a plurality of photoelectric conversion means spacially arranged on the eyepiece section side to detect the distribution of the brightness of an image picked up by the observation optical system; and
(f) a bend angle control means for controlling the angle through which the freely bendable section is to be bent in accordance with data delivered from the photoelectric conversion means in order to direct the distal end portion to the substantial center of a coeliac tube to be examined.

4,286,586

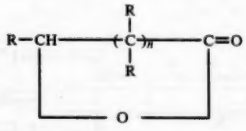
ORTHOPEDIC DEVICES, MATERIALS AND METHODS

James E. Potts, Millington, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 24,320, Mar. 27, 1979, Pat. No. 4,226,230, which is a division of Ser. No. 881,138, Feb. 24, 1978, abandoned. This application Jan. 18, 1980, Ser. No. 113,209
Int. Cl.³ A61F *5/04*
U.S. Cl. 128—90 **25 Claims**

1. Orthopedic device for the fixation and immobilization of a portion of the human or animal body comprising a solid, polymeric material, shaped to the contours of said body portion, said polymeric material comprising crosslinked copolymer which is produced by crosslinking a thermoplastic, crosslinkable copolymer, having a reduced viscosity of from 0.2 to 2.0, at a concentration of 2 grams/ml. in benzene, which thermoplastic, crosslinkable copolymer is produced by reacting, at a temperature of from 25° to 300° C., an active-hydrogen containing initiator with a molar excess of a monomer mixture comprising:

(A) from 90 to 99.5 weight percent of at least one lactone of the formula



wherein n is an integer having a value of from about 3 to 6, at least n+2 of the R's are hydrogen and the remaining R's are each alkyl of 1 to 10 carbons; and

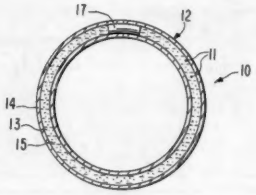
(B) from 0.5 to 10 weight percent of a polyfunctional acrylate monomer.

4,286,587

VAGINAL DRUG DELIVERY SYSTEM MADE FROM POLYMER

Patrick S. Wong, Kowloon, Hong Kong, assignor to ALZA Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 950,454, Oct. 11, 1978, Pat. No. 4,215,691, which is a division of Ser. No. 775,718, Mar. 9, 1977, abandoned. This application Jan. 21, 1980, Ser. No. 113,499
Int. Cl.³ A61F *5/46*
U.S. Cl. 128—127 **25 Claims**



10. A vaginal device for delivering drugs, said device consisting essentially of:

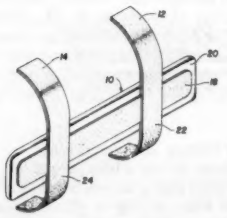
a. a closed, curved body sized and shaped as a platform adapted for easy insertion and comfortable retention in a vagina, said body consisting essentially of:
b. a wall formed of a tubular shaped, non-toxic, thermoplastic, moldable polymeric material united at its ends by a coupling inserted in the tubular wall and having a diameter approximately equivalent to the inside diameter of the tubular wall, to form an essentially liquid impervious union, with the wall surrounding and forming;
c. an internal reservoir;
d. a drug housed in the reservoir;
e. a carrier for the drug in the reservoir; and,
f. wherein, said platform at its maximum dimensions measures from a loci on its curved wall to a loci on its distant curved wall of from 0.4 cm to 16 cm, and when placed in a vagina will provide a preprogrammed, unattended continuous delivery of drug at a controlled rate and in a therapeutically effective amount to a vagina over a prolonged period of time.

4,286,588

MEDICAL SUPPORT BOARD

Paul D. Lovegrove, 2573 Merrywood Ct., Woodbridge, Va. 22192

Filed Jul. 18, 1979, Ser. No. 58,416
Int. Cl.³ A61F *13/00*
U.S. Cl. 128—133 **6 Claims**



1. An IV support board particularly adapted for emergency use comprising a rigid support member, padding covering one side of said rigid support member and adherent material for removably adhering to a cloth or fabric material underlying said rigid support member, said adherent material covering substantially the entire area of the side of the support member

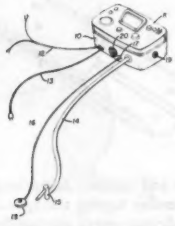
opposite the padded side whereby movement of said support board is inhibited by the adherence of the board to the underlying cloth or fabric material.

4,286,589

EXTENSION LEAD FOR A RESPIRATOR ALARM SYSTEM

Harris A. Thompson, 175 Bellevue Dr., Boulder, Colo. 80302

Filed Nov. 13, 1979, Ser. No. 93,795
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—202.22 **3 Claims**



1. In a respirator having: a primary circuit energized by an electrical power source to drive the respirator components; a normally closed alarm-initiator circuit connecting with the primary circuit; means associated with the respirator components to open the alarm-initiator circuit whenever a respirator component fails or the power source fails; a normally open alarm circuit having an alarm means and an independent power source to actuate the alarm means whenever the circuit closes; and means associated with the alarm-initiator circuit to close the alarm circuit whenever the alarm-initiator circuit opens, the improvement comprising:

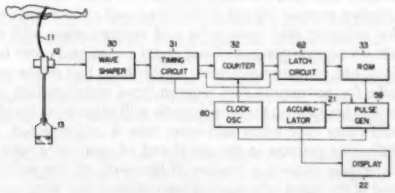
a disconnectable extension lead extended from the respirator, having a normally-closed, manually-actuatable switch at its extended end adapted to provide a manually actuated alarm function by the patient opening the normally closed manually-actuatable switch, and means in the alarm-initiator circuit adapted to close the circuit at the respirator connection point of the extension lead when disconnection of the extension lead is made, to maintain the alarm-initiator circuit in a closed state, and to open the circuit at the point of connection when connection of the extension lead is made, to place the lead in series with the alarm-initiator circuit.

4,286,590

STACTOMETRIC APPARATUS

Masakazu Murase, Fujinomiya, Japan, assignor to Terumo Corporation, Tokyo, Japan

Filed Jul. 19, 1979, Ser. No. 58,932
Claims priority, application Japan, Jul. 24, 1978, 53/90284
Int. Cl.³ A61M *5/16*; G05D *7/03*
U.S. Cl. 128—214 E **8 Claims**



1. A stactometric apparatus comprising:

instilled drop-detecting means for generating a signal each time an instilled drop falls;

a counter coupled to said instilled drop-detecting means for measuring a time interval between falling instilled drops in response to output signals from said instilled drop-detecting means;

memory means having a plurality of memory addresses at which are respectively stored a plurality of drop volume data representing different volumes of drops corresponding to different time intervals between falling instilled drops;

reading means coupled to said memory means and to said counter for reading out the drop volume data from a memory address of said memory means which is specified by the contents of said counter;

moving average measuring means coupled to said memory means for measuring a moving average of at least the drop volume data successively read out by said reading means; and

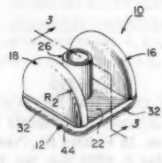
a display device coupled to said moving average measuring means for displaying the moving average of the drop volume data which has been measured by said moving average measuring means.

4,286,591

SYRINGE CAP

Kenneth Raines, Bethlehem, Pa., assignor to Burron Medical Inc., Bethlehem, Pa.

Filed Jun. 27, 1980, Ser. No. 163,694
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—215 **12 Claims**



1. A syringe cap comprising:

a base, said base having a polygonal peripheral shape, a planar top, a planar bottom, and arcuate sides connecting said planar top to said planar bottom;

a pair of arcuate wing members mounted on said base top and extending upwardly therefrom; and

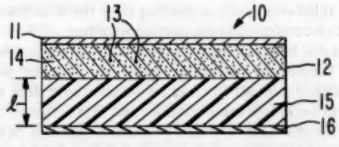
a syringe tip coupling element mounted on said base top for releasably capping a syringe.

4,286,592

THERAPEUTIC SYSTEM FOR ADMINISTERING DRUGS TO THE SKIN

Santosh K. Chandrasekaran, Palo Alto, Calif., assignor to ALZA Corporation, Palo Alto, Calif.

Filed Feb. 4, 1980, Ser. No. 117,846
Int. Cl.³ A61M *7/00*
U.S. Cl. 128—260 **5 Claims**



1. A bandage for administering a drug to the skin or mucosa for a predetermined time period, with t representing a time, in

hours, in said time period, consisting essentially of a sandwich type laminate of:

(a) a backing lamina that is substantially impermeable to the drug, one face of which forms the top of the bandage;

(b) a drug reservoir lamina adjacent the opposite face of the backing lamina comprising the drug dispersed in a carrier that is permeable to the drug, with the solubility of the drug in the carrier being C_{SDR} mg/cm^3, the diffusion coefficient of drug in the carrier being D_{DR} cm^2/hr, and the concentration of drug in the drug reservoir being C_{DR} mg/cm^3; and

(c) a contact adhesive lamina adjacent and below the drug reservoir lamina comprising a contact adhesive composition that is permeable to the drug, with the thickness of the contact adhesive lamina being l_{CA} cm, the solubility of the drug in the contact adhesive composition being C_{SCA} mg/cm^3, the diffusion coefficient of drug in the contact adhesive composition being D_{CA} cm^2/hr, and the concentration of drug in the contact adhesive composition being C_{CA} mg/cm^3, wherein over at least a substantial portion of said time period

(i) C_{CA} is not greater than C_{SCA}, and

(ii) the ratio

$$\frac{D_{CA} \cdot C_{SCA}}{l_{CA} \cdot \left(\frac{D_{DR} \cdot C_{DR} \cdot C_{SDR}}{t} \right)^{\frac{1}{2}}}$$

is in the range of about 0.01 to about 0.7.

4,286,593

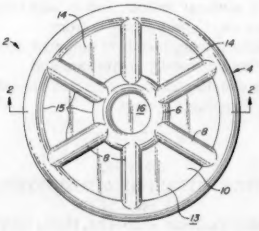
VAGINAL CONTRACEPTIVE SHIELD

Virgil A. Place, 91 Hillbrook Dr., Portola Valley, Calif. 94025, and Harold L. Crow, 25 E. 83rd St., New York, N.Y. 10028

Filed May 5, 1980, Ser. No. 146,834

Int. Cl.^{3} A61M 7/00

U.S. Cl. 128—260 **20 Claims**



1. A contraceptive vaginal shield comprising:

a circumferential plastic flexible non-elastomeric rod-like supporting member;

a thin non-elastomeric film bound to said supporting member and relatively tautly extending over the area enclosed by said circumferential supporting member;

at least one internal flexible plastic rod-like supporting member bonded to said non-elastomeric film for providing structural support for said non-elastomeric film; and

wherein said supporting member and film define at least one spermicidal reservoir and when said shield is bent into a U-shaped configuration and inserted into the vagina, the restoring forces of said flexible rod-like supporting member maintains said non-elastomeric film in juxtaposition to the vaginal wall.

4,286,594

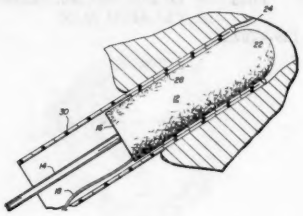
APPLICATOR AND TAMPON

Thomas W. Cunningham, 3580 Emerwood La., Orlando, Fla. 32806

Continuation-in-part of Ser. No. 43,231, May 29, 1979. This application Nov. 21, 1979, Ser. No. 96,431

Int. Cl.^{3} A61F 15/00

U.S. Cl. 128—263 **14 Claims**



1. An applicator and member comprising:

(a) an oblong member having a longitudinal central axis;

(b) a flexible applicator sleeve surrounding said member and having a longitudinal slit along a portion thereof and substantially parallel with said central axis of said member; and

(c) a convolution along said portion of said sleeve, said portion having a sufficient length to extend rearward from said convolution to the end of said member opposite said convolution, permitting said portion of said sleeve to be grasped and to be rolled at said convolution along a direction substantially parallel with said central axis.

4,286,595

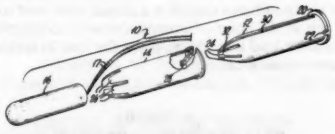
COMPACT TAMPON APPLICATOR ASSEMBLY

David F. Ring, Morganville, N.J., assignor to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Filed Sep. 27, 1979, Ser. No. 79,609

Int. Cl.^{3} A61F 15/00

U.S. Cl. 128—263 **1 Claim**



1. In a tampon applicator assembly having a proximal end and a distal end and comprising:

a generally cylindrical outer tube;

a generally cylindrical inner tube having an outside diameter less than the inside diameter of said outer tube, said inner tube being snugly nested, coaxially within said outer tube;

a tampon enclosed coaxially within said inner tube;

a gripping portion affixed to the distal end of said inner tube for gripping said inner tube and reciprocating said tube almost completely out of said distal end of said outer tube;

at least one restraining element in the distal half of the outer tube for restraining said tampon from reciprocating with said inner tube so that the tampon will remain enclosed by said outer tube when said inner tube is reciprocated; and

a deflecting portion at the distal end of said outer tube for deflecting at least a portion of the walls of the proximal end of the inner tube toward the center of the distal end of the tampon;

whereby when said inner tube is so reciprocated, said tampon will be transferred to said outer tube and when said reciprocated inner tube is then urged toward said proximal end of the assembly, the portion of the wall of said

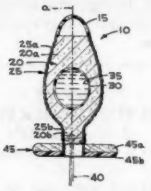
inner tube deflected toward the center of the end of the tampon will bear against said end and expel said tampon; the improvement wherein: said restraining element is a T-shaped projection.

4,286,596

TAMPON CONTAINING A LIQUID MEDICANT

Morton K. Rubinstein, Pacific Palisades, Calif., assignor to Herbert Rubinstein, Santa Cruz, Calif.

Filed Feb. 27, 1978, Ser. No. 881,651
Int. Cl.³ A61F *13/20*
U.S. Cl. 128—270 **10 Claims**



1. A tampon with a longitudinal axis for insertion in the longitudinal direction thereof into the cavity of a body in which lips surround the entranceway of the body cavity and walls surround the body cavity inwardly of the lips, said tampon comprising:

(a) a rigid entry end for insertion into the body cavity through the lips surrounding the entranceway of the body cavity;

(b) a liquid absorbable, expansible bulb-shaped tampon body extending from said entry end, said tampon body being constructed to expand radially outward from the longitudinal axis of said tampon after absorbing liquid, said bulb-shaped tampon body being formed with an ovate portion and a neck portion; and

(c) a rupturable container with liquid medicant therein disposed within the ovate portion of said tampon body, said container being rupturable to release the liquid medicant therein to be absorbed by said tampon body for expanding said tampon body radially outward from the longitudinal axis of said tampon, after said tampon is inserted into the body cavity, the lips surrounding the entranceway of said body cavity grasp said neck portion of said tampon body and the expanded ovate portion of said tampon body with absorbed liquid medicant contacts the walls surrounding the body cavity inwardly of the lips surrounding the entranceway of the body cavity to apply liquid medicant to the walls surrounding the body cavity.

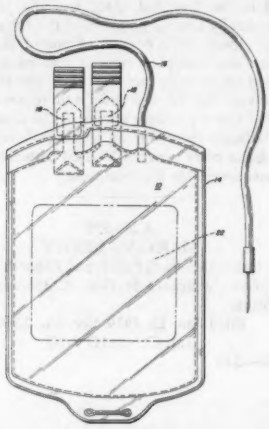
4,286,597

BLOOD COMPATIBLE POLYMERS AND MEDICAL DEVICES MADE THEREFROM CONTAINING DIOCTYLADIPATE PLASTICIZER

Henry M. Gajewski, Winnetka; Gerald A. Grode, Grayslake; Paul E. Measells, Libertyville, and Jeffrey E. Miripol, Evanston, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 954,970, Oct. 26, 1978, abandoned. This application Apr. 21, 1980, Ser. No. 142,290
Int. Cl.³ A61M *5/00*; A61J *1/00*
U.S. Cl. 128—272 **6 Claims**

1. The method of storing blood which comprises placing said blood for a period of days into a flexible, hemocompatible, sterilizable, chlorine-free plastic material which contains sufficient dioctyladipate to cause a reduced plasma hemoglobin content of blood stored in contact therewith for 21 days, when



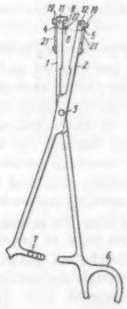
compared with blood stored in contact with the same blood compatible material free of dioctyladipate.

4,286,598

FORCEPS FOR ISOLATION OF PART OF BLOOD VESSEL DURING ANASTOMOSIS

Nikolai N. Kapitanov, ulitsa Iriny Levchenko, 3, kv.9; Natalia P. Petrova, 1 Novokuzminskaya ulitsa, 4, kv. 40, and Vladimir V. Ippolitov, ulitsa Lavochkina, 6, korpus 2, kv. 143, all of Moscow, U.S.S.R.

Filed Nov. 6, 1978, Ser. No. 958,204
Int. Cl.³ A61B *17/00, 17/12*
U.S. Cl. 128—303 R **14 Claims**



1. A surgical instrument for treating a tubular body member, vessel, duct, or the like, by clamping portions of the tubular body member at longitudinally spaced regions while providing access to a portion of the body member between the clamped portions comprising:

a pair of jaws;

means for opening and closing said jaws;

a first of said jaws defining a channel for receiving a tubular body member to be clamped, a second of said jaws being shaped to fit into and substantially close the top of said channel to define a longitudinally-extending bounded space within which a tubular body member is to be confined;

said jaws mutually coacting upon closure to provide clamping action suitable for closing off a tubular body member

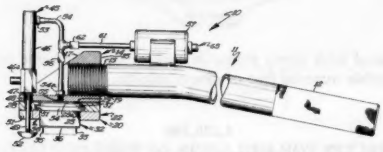
at two longitudinally-spaced regions, with at least a portion of the bounded space located between the clamping regions, so that, when a tubular body member is positioned in the bounded space and the jaws are closed, longitudinally spaced portions of the tubular body member are closed off, a portion of one of said jaws located between the clamping regions and partly defining the bounded space being movable with respect to the remainder of said one of said jaws and removable from said bounded space to allow access to the bounded space located between the clamping regions whereby that portion of a tubular body member located between said clamping regionsis accessible for treatment.

4,286,599

MARKING DEVICE

Douglas D. Hahn; Dennis E. Epley, and Kenneth I. Granle, all of Austin, Minn., assignors to Geo. A. Hormel & Company, Austin, Minn.

Filed Jan. 12, 1979, Ser. No. 2,998
Int. Cl.³ A61D *7/00*
U.S. Cl. 128—316 **5 Claims**



1. A marking device for applying marking indicia to the subcutaneous area of animals prior to slaughter, comprising:

an elongate handle;

a housing secured to one end of said handle;

a needle holder assembly secured to said housing;

a marking unit including a needle support, a plurality of hollow marking needles on said support and being arranged to define a number, said marking unit being mounted on said housing by said holder assembly;

means defining a chamber in said housing communicating with said needles;

ink dispensing means comprising a pump cylinder on said housing containing marking ink and communicating with said needles, a plunger being extensible and retractable in said pump cylinder and projecting outwardly of the latter, said plunger when in the extended position having its outer end extending beyond the needles, said plunger when moved to the retracted position causing ink to flow from the pump housing into and through the needles, whereby when the marking device is applied to the skin of an animal, such as a hog, the actuator will first engage to the animal's skin just prior to penetration of the needles through the skin whereby ink will be dispensed in a predetermined pattern through the needles into the subcutaneous fat layer of the animal.

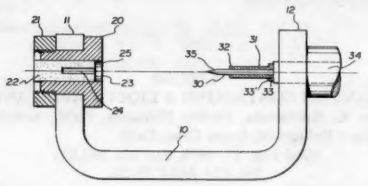
4,286,600

EAR PIERCING TOOL

Frank J. Judickas, 579 Richmond St., London, Ontario, Canada

Filed Apr. 11, 1979, Ser. No. 29,159
Claims priority, application Canada, Feb. 7, 1979, 321045
Int. Cl.³ A61B *17/00*
U.S. Cl. 128—330 **6 Claims**

1. In a tissue piercing apparatus of the type comprising: a first means for supporting a sharp, piercing needle; a second means for supporting an anvil means; means for supportively interconnecting said first and second supporting means in spaced relation and means for shifting said needle towards said anvil means so that tissue interposed between said needle and said anvil means is pierced; the improvement wherein said anvil means comprises a heating member within which is recessed a heating element having an elongated opening for receiving the tip of said needle so that a thermoplastic sleeve having a first boss performed at one end, surrounding said



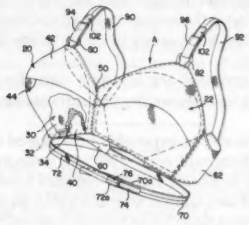
needle, after passing through said tissue, is thermoformed to form a second boss about its other end whereby said sleeve is retained in said tissue.

4,286,601

WEIGHT DISTRIBUTING DEVICE FOR USE UNDER AN X-RAY APRON

Frank G. Farino, 3311 Warrensville Center Rd., Shaker Heights, Ohio 44122

Filed Oct. 4, 1979, Ser. No. 81,764
Int. Cl.³ A41C *3/00*
U.S. Cl. 128—486 **12 Claims**



1. A weight distributing device to be worn at the bustline and between the outer garment covering the breasts of a woman and a shielded x-ray protective apron having a given weight to distribute gravity forces caused by said weight of said apron away from said breasts, said weight distributing device comprising: a body encircling band terminating in two spaced straps with free ends, means for connecting said free ends to hold said band about the bustline of said woman, first and second generally rigid, protective domes spaced longitudinally of said band, each of said domes adapted to overlie said outer garment at one of said breasts in a manner to recieve said breast in said dome, each of said protective domes including an outer layer of sheet material, an inner layer of sheet material and a free standing generally conical cup sandwiched between said layers, said domes forming a part of said band and being held by said band over the breasts of a user of said device and said conical cups of said protective domes being generally rigid in a direction axially toward said breasts whereby a force from said apron against said domes will be transmitted away from said breasts under said domes.

4,286,602

TRANSILLUMINATION DIAGNOSTIC SYSTEM

Robert Guy, 4, rue de la Charite, Lyons, France (69002)

Filed Jun. 20, 1979, Ser. No. 50,329
Int. Cl.³ A61B *5/00, 6/12*
U.S. Cl. 128—665 **8 Claims**

1. A transillumination examination system operable by a single operator for observing a selected portion of the human anatomy, such as the breast, without imparting excessive heat

thereto, and for taking pictures of internal regions therein of medical interest, said system comprising:

(A) a light-beam projecting gun having a barrel extending axially from a hollow body section and a grip extending laterally therefrom which is adapted to be held in one hand of the operator, said barrel having a front end and a rear end;

(B) a reflector-type incandescent lamp housed in said body section, the rim of the reflector being sealed to the rear end of the barrel to project light rays through the barrel into the anatomical portion to be transilluminated, the front end of the barrel being covered by a diffuser plate to provide a light beam whose intensity is substantially uniform throughout its cross section, the plate also preventing the flow of convection currents from the barrel which would otherwise tend to heat the anatomical portion, said grip being provided with a trigger-finger switch to activate said lamp;

(C) a power-supply connected to said lamp through said switch and including a timer to energize said lamp upon operation of said switch for a predetermined time interval whose duration is sufficient to carry out an examination procedure but not long enough to overheat the anatomical portion being transilluminated; and

(D) a camera assembly constituted by a bracket having at one end thereof a guide fixture adapted to engage the anatomical portion to be examined, and having at the other end thereof a camera whose lens is trained on said guide fixture and is focused on said anatomical portion, said camera having a shutter mechanism which is remotely operated by an actuator where[by] the operator who grips the gun in one hand and opera[tes] said switch to produce the light beam for transilluminating said anatomical portion, can observe the transilluminated image created at the fixture and take a focused picture thereof by operating the actuator with his other hand or foot.

4,286,603

PRESSURE DETECTION ARRANGEMENT

Lee Marshall, 2808 Oregon Ct., J-3, Torrance, Calif. 90503

Filed Jun. 22, 1979, Ser. No. 51,431

Int. Cl.[3] A61B *5/10*

U.S. Cl. 128—782 **14 Claims**

1. A pressure detection arrangement for placement intermediate a part of the body and means surrounding the part of the body and comprising, in combination:

a capsule comprising:

a reservoir means having first walls and second walls defining a reservoir cavity, and said first walls further defining a lower portion of said reservoir cavity having a first predetermined flexibility, and said second walls further defining an upper portion of said reservoir cavity having a second predetermined flexibility;

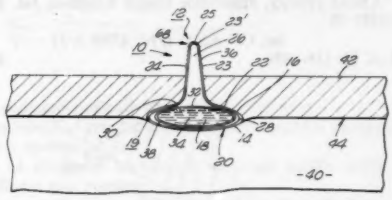
an indicator means having third walls defining an indicator cavity having a third predetermined flexibility having a preselected transmissivity for electromagnetic radiation in the visible portion of the electromagnetic radiation spectrum to allow visual inspection therethrough of said indicator cavity;

said first walls coupled to said second walls;

said second walls further defining a first aperture through said second walls;

said third walls coupled to said second walls adjacent said first aperature;

a flexible, extensible separation means across said first



aperture to close communication between said reservoir cavity and said indicator cavity; and

an indicator fluid in said reservoir cavity and said separation means responsive to a predetermined pressure exerted on said indicator fluid in said reservoir cavity to flexibly extend into said indicator cavity to allow said indicator fluid to enter said indicator cavity and said separation means separating it from said third walls of said indicator means by said indicator fluid for the condition of said reservoir cavity subjected to at least said predetermined pressure.

4,286,604

SMOKING MATERIALS

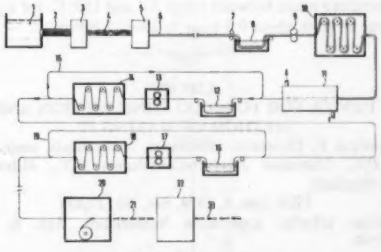
Jacques Ehretsmann, Conches; Robert D. Cowling; Alfred D. Schweizer, both of Geneva, all of Switzerland; William M. Caldwell, Newtownards, Northern Ireland; Dennis F. Boyd, Belfast, Northern Ireland, and Robert J. Boyd, Craigavad, Northern Ireland, assignors to Gallaher Limited, Belfast, Northern Ireland

Filed Oct. 3, 1977, Ser. No. 838,712

Claims priority, application United Kingdom, Oct. 5, 1976, 41271/76; Oct. 5, 1976, 41272/76; Oct. 5, 1976, 41273/76

Int. Cl.[3] A24B *15/18;* A24D *1/18*

U.S. Cl. 131—359 **28 Claims**



1. A method of making a smoking product by subjecting a mass of viscose fibres to a controlled pyrolysis until the organic residue contains at least 90% carbon by weight, and loading the resulting fibrous mass with the ingredients for smoking, wherein at least one additive selected from the group consisting of a catalyst for the pyrolysis, a carrier for a stimulant additive, and a combustion modifying agent or its precursor is added to a bulk viscose mix and said fibres are spun from said

mix whereby the additives are homogeneously dispersed throughout the individual fibres.

4,286,605

TREATING SHEET MATERIAL FOR MAKING CIGAR WRAPPERS

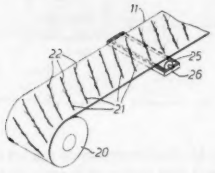
John K. Goslin, Beeston; John H. Bugler, Caunton, and Howard Foster, Long Eaton, all of England, assignors to Imperial Group Limited, London, England

Filed Jul. 6, 1979, Ser. No. 55,143

Claims priority, application United Kingdom, Jul. 27, 1978, 31391/78

Int. Cl.³ A24D *1/18;* A24B *3/14*

U.S. Cl. 131—358 **4 Claims**



1. A method of treating a web of smokeable sheet material to simulate natural tobacco leaf before the web is cut to provide a series of cigar wrapper blanks which comprises printing the web with an ink in a pattern designed to simulate markings of natural tobacco leaf, the ink having a thickened composition which dries to form a ribbed pattern on the web, said ink comprising a filler, a non-water-based solvent, an adhesive, a plasticizer and a powder which produces a desired colouration, said powder comprising ground tobacco dust.

4,286,606

TOBACCO FLAVORANTS

James W. Swain, and Frank H. Crayton, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Jun. 18, 1979, Ser. No. 49,361

Int. Cl.³ A24B *15/30;* C08B *37/00, 3/00*

U.S. Cl. 131—276 **14 Claims**

1. A method of preparing a reaction flavor which comprises combining reactants including a reducing sugar, in the presence of ammonium hydroxide with a saturated or unsaturated carboxylic acid or mixtures thereof, said acid having between about 6 and 26 carbon atoms, and heating the reactants in a temperature range between about 70° and 150° C. for a period of time of from about 0.5 hour to about 3 hours.

4,286,607

DEVICE FOR TOBACCO CONSUMPTION AND METHOD OF MAKING IT

Dominique F. Claessens, Hilversum, Netherlands, assignor to D.P.G. Claessens Product-Consultants B.V., Hilversum, Netherlands

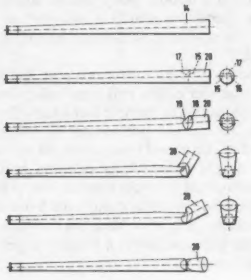
Filed Apr. 6, 1979, Ser. No. 27,931

Claims priority, application Netherlands, Apr. 6, 1978, 7803694

Int. Cl.³ A24F *47/00, 1/28*

U.S. Cl. 131—328 **56 Claims**

1. A method of making a device for tobacco consumption, which comprises forming an elongated hollow member; forming a mouthpiece on one end of said hollow member; forming the other end of the hollow member so that the same can be provided with a tobacco plug; and providing means at least at one position intermediate the two ends of the hollow member for bending said hollow member by making two oppositely-located indents in the wall of the member and a third indent extending transversely to said indents and to the longitudinal



axis of the member, said third indent being retracted somewhat relative to the plane containing the first two indents.

4,286,608

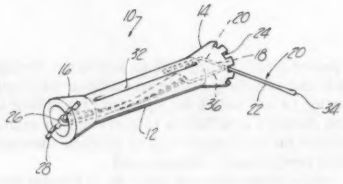
HAIR ROLLER

Charles L. Handley, Dearborn, and James R. Ostheim, Ferndale, both of Mich., assignors to Charade Hair and Skin Care Center, Inc., Dearborn, Mich.

Filed Mar. 14, 1977, Ser. No. 777,170

Int. Cl.³ A45D *2/00*

U.S. Cl. 132—40 **1 Claim**



1. A hair roller comprised of a spindle member adapted to receive a lock of hair to be wound into a curl thereon comprised of a hollow spindle member; anchoring means carried by said spindle, said anchoring means including a radial projection, said anchoring means includes an anchor clip having a closed loop section connected to said radial projection and disposed in one end of said hollow spindle member and adapted to engage the inside thereof to orient said radial projection in a radially outward orientation with respect to said hollow spindle member; means mounting said anchor clip to said spindle member comprising means resiliently retaining said loop section within said one end of said hollow spindle member including an elastic element passing through said loop section and extending through the interior of said hollow spindle member and further includes means securing said elastic element to said hollow spindle member at the opposite end portion thereof from said one end portion of said hollow spindle member; means allowing said radial projection to be angularly located with respect to said one end of said spindle member without disassembly thereof from said hair roller by pulling said loop section partially out of said hollow spindle end comprising a plurality of notches formed in the said end portion of said hollow spindle member adapted to mate with said radial projection to angularly locate said anchor clip therein, said anchor loop section locating said radial projection with respect to said hollow spindle member one end so as to insure engagement of said radial projection with one of said notches upon release of said loop section; said anchor clip comprising a wire form element having said loop section formed thereof and said

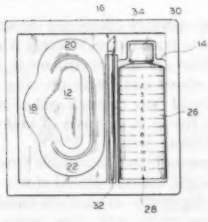
radial projection formed by a section of said wire form adapted to extend radially away from said hollow spindle member when said loop section is disposed in said end portion of said hollow spindle member; said hollow spindle member being comprised of flare end portions and wherein said wire form member has an inclined side thereof extending at an angle to said projection at an angle corresponding to said angle of said flare in said end portion of said hollow spindle member.

4,286,609

HOT OIL FINGERNAIL AND CUTICLE TREATMENT

Aaron Miller, Northbrook, Ill., assignor to Jovan, Inc., Chicago, Ill.

Filed Oct. 6, 1978, Ser. No. 949,197
Int. Cl.³ A45D *29/20*
U.S. Cl. 132—75 **3 Claims**



1. A hot oil treatment for conditioning fingernails and cuticles comprising the steps of:

a. packaging a kit in a combined soaking basin and shock-absorbing container for a combination of components including a bottle of an oil mixture of components used in a bath;

b. pouring a measured amount of said oil mixture from said bottle into said basin;

c. pouring hot water into said basin to raise the fluid level within said basin to a predetermined depth;

d. soaking the tips of the fingers of each hand in said basin for a substantially predetermined period of time adequate to soften the cuticle; and

e. working the cuticle while it is in the softened state; said oil being a mixture which comprises:

INGREDIENT	PERCENTAGE RANGE
1. Sesame oil	0.1–20.0
2. Olive oil (food grade)	0.1–20.0
3. Mink oil	0.5–20
4. Soybean oil (food grade)	0.5–20
5. Polyoxyethylene (40) sorbitan peroleate	1.0–10.0
6. Polyoxypropylene (15) stearyl ether	1.0–60.0
7. Raw linseed oil	1.0–40.0
8. Cottonseed oil	1.0–75.0
9. Butylated hydroxyanisole	0.05–1.0
10. Propylparaben	0.05–1.0
11. Myristoyl hydrolyzed animal protein	0.10–5.0
12. Vitamin E (dl-Alpha Tocopheryl acetate)	0.5–1.0
13. Vitamin A Palimate	.05–1.0
14. Bronopol (2-Bromo-2-Nitropropane-1,3-Diol)	.01–.5
15. Perfume oil	.05–1.0

4,286,610

PEDICURE IMPLEMENT

John E. Jones, Danville; William G. Fodor, Blairs; James R. Porter, Danville, all of Va., and James E. Edgell, Senatobia, Miss., assignors to Sandvik, Ind., Greensboro, N.C.

Filed Jun. 9, 1980, Ser. No. 157,672
Int. Cl.³ A45D *29/04*
U.S. Cl. 132—76.4 **1 Claim**

1. A pedicure-manicure implement, comprising:

(a) an integral, smooth surfaced, plastic molded elongated body having:

(i) an elongated horizontally disposed handle above a finger grip opening;

(ii) smoothly contoured upright molded handle support portions extending from opposite ends of said handle and located proximate the outer ends of said body; and

(iii) a base portion providing a pair of generally triangular-shaped outer base sections extending outwardly from a generally rectangular smoothly curved and surfaced central base section, said outer base sections each having a rib-recess configuration within and recessed inwardly from the respective plane of surrounding edge portions defining each respective said triangular shape of each said outer base section and with said base section planes being slightly angled upwardly with respect to a horizontal plane when said implement rests thereon supported by said central base section;

(b) a pair of thin, flexible, stainless steel, etched-type abrader strips, one being relatively coarse and the other being relatively fine and being of a generally triangle shape conforming to the said outer base section recesses and respectively mounted therein; and

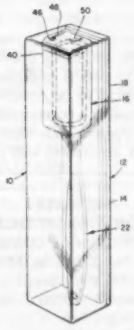
(c) adhesive means applied to the respective back surfaces of said strips to secure said strips to said ribs.

4,286,611

DENTAL FLOSS DISPENSER

Patricia A. Talbot, 44 Fulton St., Norwood, Mass. 02062

Filed Feb. 14, 1980, Ser. No. 121,322
Int. Cl.³ A61C *15/00*
U.S. Cl. 132—91 **4 Claims**



1. In combination, a dental floss dispenser and a container for the same, said dispenser comprising a hollow cylindrical body portion, and a handle detachably secured to one end of the body portion having a removable cover, a spool of dental floss

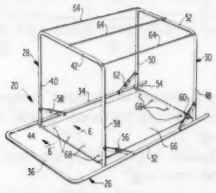
mounted within the hollow body portion and means in said cover for permitting a length of floss to be withdrawn therefrom and cut off for use.

4,286,612

FOLDING TENT

William Neal, and Mary Neal, both of 191 Denise, San Pablo, Calif. 94806

Filed Mar. 7, 1979, Ser. No. 18,341
Int. Cl.³ A45F 1/16
U.S. Cl. 135—4 R **6 Claims**



1. A folding tent comprising:

a foldable frame including a U-shaped base member having a pair of spaced parallel legs on opposite sides thereof adapted to rest horizontally on the ground and a pair of U-shaped upright support members having apertures through the end portion of the legs thereof;

said U-shaped upright support members having pivotally connected at spaced locations to said legs of said member and pivotable from a folded position wherein said frame is collapsed with the three U-shaped members contained in substantially the same plane to an upright position wherein one of said upright support members extends upwardly across an end portion of said base between the legs thereof and the other member is disposed parallel thereto across the opposite end portion of said base, opposed ends of said upright members being pivotally connected to opposite legs of said U-shaped base member; means connected between the legs of the base and the upright member for locking said members in an upright position;

a pair of spaced stabilizer rods, each rod mounted between opposite legs of said base member and extending through adjacent apertures in the end portions of a respective upright support whereby said rods pivotally connect said uprights to said base;

a set of support rods attachable longitudinally between said upright U-shaped support members in the upright positions thereof;

a cover adapted to fit over said U-shaped upright support members and support rods to provide a protective enclosure, said cover being generally rectangular in cross sectional configuration and being provided with an entrance opening adjacent an end of said base; and

a floor member adapted to be removably attached to said stabilizer rods including a rectangular sheet having a set of snap fasteners at opposite ends thereof whereby said ends may be removably secured to said rods.

4,286,613

APPARATUS FOR AND METHOD OF FREEZE PROTECTING PLUMBING

Marvin Lacoste, P.O. Box 292, Kiln, Miss. 39556

Filed Jan. 16, 1980, Ser. No. 112,485
Int. Cl.³ E03B 7/12
U.S. Cl. 137—62 **1 Claim**

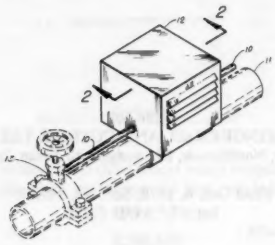
1. In a plumbing system subjected to ambient freezing temperatures, includes an apparatus for freeze protecting said plumbing system, said apparatus comprising:

(a) drain pipe connecting means extending parallel to the plumbing system from the warmest ambient environment to the ambient coldest environment thereof and to a drain means;

(b) bleed valve means mounted in said plumbing system in said warmest ambient environment and joined to said connecting means for the bleeding off of liquid from said plumbing system;

(c) gate valve means mounted in said connecting means at said coldest ambient environment for opening and closing said connecting means to said drain;

(d) thermostat means mounted adjacent said gate valve



means and operably connected thereto for actuating said gate valve to open before freezing temperature is reached in the coldest ambient environment, and to close at temperatures above said freeze opening temperature for ensuring a liquid flow through said plumbing system before liquid can freeze in any part of said plumbing and drain pipe connecting means;

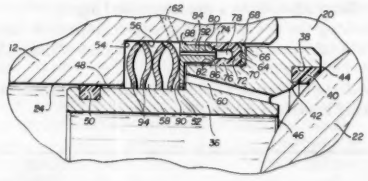
(e) all said means being detachable from the plumbing system as a single unit and placed at any exterior point along the plumbing system to bleed off liquid from the plumbing system through the gate valve means to the drain means.

4,286,614

HIGH TEMPERATURE BALL VALVE

Gary W. Kacal, Rosenberg, and Charles C. Partridge, Houston, both of Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Sep. 19, 1979, Ser. No. 77,078
Int. Cl.³ F16K 25/00, 5/22
U.S. Cl. 137—72 **15 Claims**



1. A valve comprising:

a valve body having a valve chamber and a fluid flow passage;

a valve member mounted in said valve chamber for movement between an open position and a closed position relative to said flow passage;

an annular valve seat mounted about said flow passage for sealing against the valve member, said valve seat having a lubricant passage therein adapted to receive lubricant for emergency sealing;

a fire destructible packing ring extending around said valve seat to provide a seal between the valve seat and body;

a metal wedge element mounted around said valve seat adjacent said packing ring, said wedge element having a projecting portion thereof normally held away from said

lubricant passage by said packing ring but adapted to close off said lubricant passage upon destruction of said packing ring; and

resilient means for urging said wedge element against said packing ring to expand the packing ring against said valve body and valve seat by wedging action, said resilient means acting to force said projecting portion of the wedge element against said valve seat at a location to close off said lubricant passage upon destruction of said packing ring.

4,286,615

APPARATUS FOR MEASURING THE AMOUNT OF FLUID SUPPLIED BY A FLUID SUPPLY DEVICE

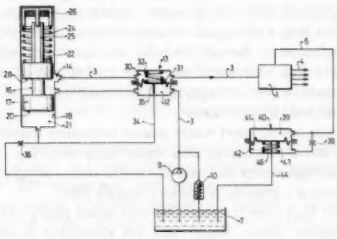
Gerhard Stumpp, Stuttgart, and Wolf Wessel, Oberriexingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 12, 1979, Ser. No. 19,521

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1978, 2812233

Int. Cl.³ G05D *11/03*

U.S. Cl. 137—117 **1 Claim**



1. A device for detecting and measuring the amount of fluid delivered by a fluid delivery device having a supply line for the fluid under pressure to the delivery device having an apportioning cross-section valve characterized by the fact that a piston means is integrated in the supply line, a pressure comparison valve responsive to spring means for providing a nominal value and for comparing the pressure contrast which appears at said apportioning cross-section valve with said nominal value in said pressure comparison valve and an adjustment device for providing a correcting regulation of said piston means, said adjustment device being activated in accordance with the deviation of said pressure contrast from said nominal value and wherein the position of said piston means provides a measure of the amount of flowing fluid per unit of time,

a fluid tank, a return flow line connected to said fluid tank wherein a part of the apportioned amount of fluid is returned through said return line to the fluid tank characterized by the fact that in said return line a constant flow-through cross-section orifice is provided and a differential pressure valve operatively associated with said flow-through cross-section orifice for the generation of a constant pressure contrast at said flowthrough cross-section orifice,

a relief line having a flowthrough cross-section means characterized by the fact that said differential pressure valve controls an outlet cross-section valve following said flow-through cross-section means in said relief line, and

a displacement-voltage converter connected to said piston means for generating an electrical control value signal directly proportional to the displacement of said piston means.

4,286,616

NON-FREEZE WALL HYDRANT

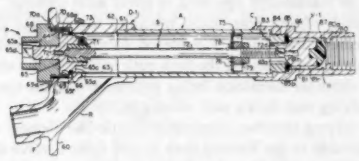
Irlin H. Botnick, 3155 Kersdale Rd., Pepper Pike, Ohio 44124

Division of Ser. No. 654,866, Feb. 3, 1976, Pat. No. 4,221,233, said Ser. No. 654,866, is a continuation-in-part of Ser. No. 425,503, Dec. 17, 1973, Pat. No. 3,952,770. This application Apr. 16, 1980, Ser. No. 140,723

The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.

Int. Cl.³ F16K *31/50*

U.S. Cl. 137—327 **10 Claims**



1. In a wall hydrant including a building wall penetrating straight tubular conduit element, a water pipe inlet connection element joined on one end of the conduit element as a hydrant inner end, and a hollow open-ended operating and discharge end element with its inner end joined on the other end of the conduit element, as a hydrant outer end to be accessible at the outside of the building wall, the discharge end element having a lateral outlet, said elements constituting a hydrant body, and a water valving member axially shiftable in and out of an inlet passage closing position at a valving bore of said inlet element for opening and closing the hydrant, the structure comprising:

operating shaft means extending through and axially shiftably supported in said body to control axial shift of said valving member in and out of said closing position,

a closure element secured to and sealed in the other, outer, end of said discharge element as a plug and providing an end wall with a threaded central aperture coaxially aligned with the conduit element and said valving bore and having said shaft means threaded therethrough to be rotationally operated to effect axial shifting;

said valving bore interiorly terminates at and opens toward said conduit element through a valving seat structure including an annular male-threaded element screwed into a female thread at the end of the valving bore,

said annular element has a torque tool accepting formation axially accessible from its outer end;

said operating shaft means comprises

a valve operating rod extending coaxially through said conduit element, and

an element having on one end a steam threaded through the end wall threaded aperture and at its other end a coaxial socket,

said rod as a separable element having one rod end set-screw secured in said socket and the other rod end supported coaxially of said conduit for operation of said valving member;

the set screw-secured rod end carrying a torque tool element adapted to rotationally drivingly engage with said accepting formation,

whereby upon extraction of said closure with said operating shaft means from the hydrant body, and release of said rod from its set screw securement and end-for-end reversal, the rod provides a tool for removal of said annular element of the seat structure.

8. In a wall hydrant including a building wall penetrating straight tubular conduit element, a water pipe inlet connection element joined on one end of the conduit element as a hydrant inner end, and a hollow open-ended operating and discharge end element with its inner end joined on the other end of the conduit element, as a hydrant outer end to be accessible at the outside of the building wall, the discharge end element having a lateral outlet, said elements constituting a hydrant body, and

a water valving member axially shiftable in and out of an inlet passage closing position at a valving bore of said inlet element for opening and closing the hydrant, the structure comprising:

operating shaft means extending through and axially shiftably supported in said body to control axial shift of said valving member in and out of said closing position,

a closure element secured to and sealed in the other, outer, end of said discharge element as a plug and providing

an end wall with a threaded central aperture coaxially aligned with the conduit element and said valving bore and having said shaft means threaded therethrough to be rotationally operated to effect axial shifting;

the said valving bore opens inwardly toward said conduit element through a shouldered formation of said inlet element surrounding the flow path to the conduit element,

said shoulder formation being provided with an apertured valving seat facing said valving bore;

said valving member comprises a shuttle-like element axially slideable in the valving bore to and from a valve closing position with one end sealingly engaging said valving seat,

said shuttle-like element with a surrounding cylindrical surface of the valving bore defining flow space in the inlet element from the water pipe connection to the apertured seat;

said operating shaft means includes a push-rod extending coaxially through said conduit element and engageable with said one end of the shuttle element to displace it axially from said seat, and to hold it displaced in an open position against forces urging it back to closed position;

said inlet connection element has a radial constriction at the inlet end of said valving bore having a central inlet aperture; and

the other end of said valving member bears a seal element engageable with the said constriction as a seat for closing the central inlet aperture by backward shift of the valving member upon a vacuum condition arising in connected supply piping.

10. In a wall hydrant including a building wall penetrating straight tubular conduit element, a water pipe inlet connection element joined on one end of the conduit element as a hydrant inner end, and a hollow open-ended operating and discharge end element with its inner end joined on the other end of the conduit element, as a hydrant outer end to be accessible at the outside of the building wall, the discharge end element having a lateral outlet, said elements constituting a hydrant body, and a water valving member axially shiftable in and out of an inlet passage closing position at a valving bore of said inlet element for opening and closing the hydrant, the structure comprising:

operating shaft means extending through and axially shiftably supported in said body to control axial shift of said valving member in and out of said closing position,

a closure element secured to and sealed in the other, outer, end of said discharge element as a plug and providing

an end wall with a threaded central aperture coaxially aligned with the conduit element and said valving bore and having said shaft means threaded therethrough to be rotationally operated to effect axial shifting;

said shaft means carries

a guide support disk element rotationally and axially slideably engaging an interior cylindrical surface of said tubular conduit element, and having flow apertures therethrough, and

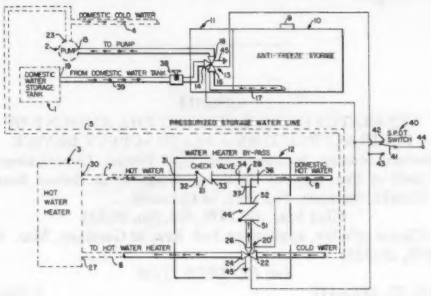
a flexible elastomeric seal disk on the downstream side of the disk element normally having a peripheral light interference with the conduit element and covering said flow apertures whereby back flow is prevented and by flexing of the seal disk away from the disk element forward hydrant discharge flow permitted.

4,286,617

WATER SYSTEM FREEZE PROTECTION APPARATUS

Marvin J. Bedient, Caldwell, Id., assignor to John Swan, Bend, Oreg.

Filed Feb. 8, 1979, Ser. No. 10,395
Int. Cl.³ E03C 1/02
U.S. Cl. 137—334 **6 Claims**



1. In a recreational vehicle water system including:

(a) a main water storage tank containing a supply of water;

(b) a water pump having an inlet and an outlet, said inlet being in fluid communication with said supply of water in said main water storage tank and said outlet supplying pressurized storage water;

(c) a water heater, said water heater including a water inlet and a hot water outlet, said water inlet receiving pressurized storage water and said hot water outlet supplying hot water to a domestic hot water supply line;

(d) a cold water tap intermediate said water pump outlet and said water heater water inlet for supplying pressurized water to a domestic cold water supply line;

wherein the improvement comprises an improved anti-freeze apparatus for use in the water system comprising:

(e) an anti-freeze storage tank containing a supply of anti-freeze;

(f) a first three-way valve means in fluid communication with said anti-freeze storage tank and interposed between said water storage tank and said water pump;

(g) a second three-way valve means for providing fluid communication between said water pump outlet, said water heater inlet and said domestic hot water line, said second valve means including a check valve positioned between said water heater hot water outlet and said domestic hot water line;

wherein said water system has a normal water supply state and an anti-freeze protection state, in said normal water supply state said first valve means permits water to flow from said storage tank to said water pump and said second valve means permits pressurized storage water to flow to said water heater inlet; and

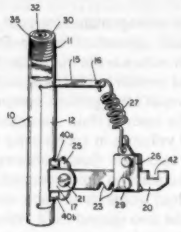
in said anti-freeze protection state said first valve means prevents the flow of storage water from said storage tank and fluidly connects said supply of anti-freeze to said water pump, and said second valve means prevents the flow of pressurized fluid to said water heater water inlet while connecting said pressurized storage water supply line to said domestic hot water supply line, thereby bypassing said water heater inlet, said check valve automatically preventing the flow of anti-freeze into said water heater through said hot water outlet, whereby anti-freeze is supplied to the entire water system except for said hot water heater and said water storage tank.

4,286,618

VALVE

Chang Bang, Stone Mountain, and Scott Row, Marietta, both of Ga., assignors to Korus, Inc., Atlanta, Ga.

Filed May 9, 1980, Ser. No. 148,131
Int. Cl.³ F16K 21/04; A01K 7/02
U.S. Cl. 137—408 **1 Claim**



1. An improved liquid control valve comprising in combination:

a valve housing:

a selectively deformable sleeve within said valve housing;

means defining a first orifice and a second orifice extending from the outside to the interior of said valve housing, said first orifice and said second orifice characterized, respectively, by a first orifice longitudinal axis and a second orifice longitudinal axis, said first orifice longitudinal axis and said second orifice longitudinal axis being substantially perpendicular to the longitudinal axis of said valve housing;

first and second piston members for deforming said deformable sleeve and being slidably inserted, respectively, into said first orifice and said second orifice;

a lever means pivotally mounted externally to said valve housing about a lever axis extending between said first and second orifice longitudinal axes including a support location at a distal end for supporting a discharge container and a cross member at a near end extending substantially perpendicular to said lever axis, said first and second orifice longitudinal axes passing through said cross member:

said lever means being rotatable about said lever axis to an open position wherein said first and second piston members are urged equal distances into said valve housing; and

biasing means coupled to said lever means for biasing said lever means toward a cutoff position at which said cross member urges said first piston member into said interior of said valve housing to deform and pinch off said deformable sleeve and at which said deformable sleeve urges said second piston member out of said valve housing toward said cross member.

4,286,619

BALLCOCK ASSEMBLY

Albert E. Straus, Erie, Pa., assignor to Hoover Universal, Inc., Saline, Mich.

Filed May 7, 1979, Ser. No. 36,399
Int. Cl.³ F16K 31/26
U.S. Cl. 137—426 **17 Claims**

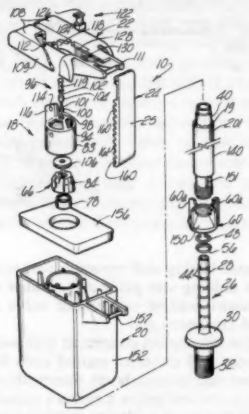
1. A ballcock valve assembly for controlling the supply of liquid to a liquid storage tank comprising,

an upright standpipe for conveying liquid under pressure to said storage tank,

valve means on said standpipe at the upper end thereof operable to control the delivery of liquid to said tank, said valve means including a housing, a valve seat, and a valve element movable in a downward direction to an opened position against the flow of liquid flowing through said standpipe and movable in an upward direction to a closed position abutting said seat against which said valve element is urged by said liquid under pressure,

a float unit surrounding said standpipe and movable vertically in response to changes in the level of liquid in said tank, and

an actuating member being pivotally connected at spaced apart locations thereon to said housing and to said float unit through a linkage means for moving said valve element essentially vertically between its opened and closed positions in response to the vertical movement of said float unit so that a change in the level of liquid in said tank enables the vertical movement of said float unit to be transmitted to said valve element, said actuating member engaging said valve element to translate the downward



movement of said float unit to said valve element to move it downwardly to said opened position when the level of liquid in said tank drops below a predetermined level.

3. The ballcock valve assembly that is defined in claim **1**, wherein said linkage means includes a connector means releasably connected to said valve actuating member and to said float unit, said connector means including a plurality of vertically spaced horizontal C-shaped sockets, said valve actuating member and said float unit having horizontally extending pin means pivotally and releasably connected to selected ones of said C-shaped sockets to establish a selected vertical height between said float unit and said valve actuating member to vary the level of liquid in said tank at which said valve means is actuated and, further, to limit rotation of said float unit with respect to said standpipe.

4,286,620

COMBINATION TORCH AND CHECK VALVE ASSEMBLY

Larry R. Turney, Denton, Tex., assignor to Victor Equipment Company, Denton, Tex.

Filed Jul. 14, 1980, Ser. No. 167,827
Int. Cl.³ F16K 19/00
U.S. Cl. 137—454.2 **9 Claims**

1. In a torch combination that includes at least a body, barrel and a head that includes at least fuel and oxygen passageways and at least respective fuel and oxygen valves; the improvement comprising:

two respective check valve bodies disposed in fluid communication with said respective fuel and oxygen passageways and connected with said torch handle; each said check valve body having a chamber for receiving a check valve subassembly; each said chamber having a first end having a passageway and having a second end open for receiving said check valve subassembly;

two respective check valve subassemblies inserted within said

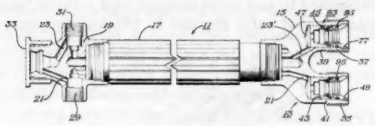
respective chambers; each said check valve subassembly including;

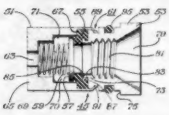
a. a guide having at least one flow passage and a central bore having a first diameter at a first end and a second diameter greater than said first diameter at a second end for receiving a retainer;

b. a retainer disposed with a first end disposed in said second diameter passageway;

c. a seal disposed on said first end of said retainer;

d. a moveable seat disposed in said guide and adjacent said seal;





e. biasing means biasing said moveable seat toward said seal;

f. first means holding said guide and retainer together; and

g. second means holding said check valve subassemblies within said chambers; and

respective hose connectors connected with said check valve bodies adjacent said chamber second ends for connecting respective fuel and oxygen hoses therewith; such that any reverse flow is arrested before it enters a respective hose and regulator and danger of explosion is minimized.

4,286,621

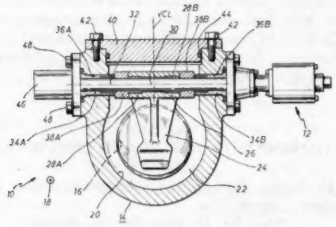
DUAL ACTING CHECK VALVE DAMPENER

Robert J. Glahn, Tulsa, Okla., assignor to Geosource Inc., Houston, Tex.

Filed Dec. 17, 1979, Ser. No. 103,902

Int. Cl.[3] F16K *1/20, 21/10*

U.S. Cl. 137—514 **12 Claims**



1. In a valve having a clapper mounted on a valve shaft for opening and closing movement out of and into a flow path defined between an inlet and an outlet port provided in a valve casing, wherein the improvement comprises a dampener arrangement for damping both the opening and closing movement of the clapper, the dampener arrangement comprising:

a fluid-tight housing having a first and a second radially inwardly directed stator member cooperating to subdivide the cavity into a first and a second cavity, each cavity being adapted to receive a damping fluid therein;

a rotor connectable to the valve shaft for movement therewith, the rotor having a first and a second vane extending therefrom, each vane subdividing one of the cavities into a first and a second fluid volume, each vane being displaceable within the cavity in which it is disposed in a first and a second direction in accordance with the opening and closing movement of the clapper, the movement of the clapper being adapted to be retarded by movement of each vane through damping fluid in each cavity increasing the pressure of damping fluid disposed in the fluid volume forward of each vane in the direction of movement thereof; and

a pressure relief arrangement disposed within the rotor to relieve pressure generated in the fluid in the volumes forward of the vanes in the direction of movement thereof when the fluid pressure exceeds a predetermined pressure, the pressure relief arrangement comprising a first passage disposed in the rotor in fluid communication with each of the first fluid volumes in each cavity to balance the pressures in the two first fluid volumes; a second passage disposed in the rotor in fluid communication with each of the second fluid volumes in each cavity to balance the pressures in the two second fluid volumes; a bore placing; the first and second passages in communication with each other and a relief valve disposed between the first and second passages to cooperate with the bore, the relief valve being biased to a normally closed position, and the relief valve being responsive to a force imposed thereon when the pressure of fluid in one of the passages exceeds the predetermined pressure to open the valve and to communicate the first passage with second passage through the bore.

4,286,622

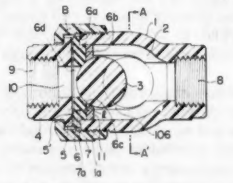
CHECK VALVE ASSEMBLY

Youichi Ninomiya, 12-1 Yamashita-cho 3-chome, and Kazuhiko Tsuno, 106, Kamaeguchi-cho 2-chome, both of Nobeoka-shi, Miyazaki-ken, Japan

Filed Jan. 21, 1980, Ser. No. 113,524

Int. Cl.[3] F16K *15/04*

U.S. Cl. 137—533.11 **6 Claims**



1. A check ball valve assembly comprising:

a main valve body member comprising a hollow cylindrical body element defining a fluid flow path and a first pipe coupling member positioned at a first end of the fluid flow path and integral with the body element;

a ball valve member positioned in said hollow cylindrical body for movement between a blocking position blocking said fluid flow path and an unblocking position spaced from the blocking position, the blocking position being at a second end of the fluid flow path;

a second pipe coupling member detachably connected to said main valve body member at the second end of the fluid flow path;

a resilient sealing member positioned between said second pipe coupling member and said main valve body member, said sealing member having an inner surface contacted by said ball valve member in said blocking position to thereby seal the fluid flow path and having portions thereof forming a seal between said valve body member and said second pipe coupling member; and

a retainer ring fixedly positioned between said sealing member and said ball valve member, said retainer ring being

formed of a material harder than that forming the sealing member and having a central tapered fluid passage allowing bore engageable by said ball valve member in said blocking position to thereby limit movement of said ball valve member and prevent excess pressure contact between said ball valve member and said sealing member.

4,286,623

FAUCET CONTROL DEVICE

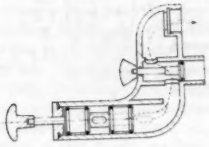
Moschoula Spanides, 82a, Themistokleous St., Piraeus, Greece

Filed Nov. 6, 1979, Ser. No. 91,732

Claims priority, application Greece, Nov. 10, 1978, 57630; Dec. 9, 1978, 57826; May 4, 1979, 59005

Int. Cl.³ F16K *19/00*

U.S. Cl. 137—597 **2 Claims**



1. Apparatus comprising a hollow sleeve member having hot and cold water inlets for connection to hot and cold water supplies, and one outlet, and piston means slidably mounted in said sleeve for movement between a first position in which said inlets communicate with said outlet, and a second position in which said inlets are blocked,

said sleeve having a cylindrical bore,

said inlets being axially located at different levels,

said inlets being provided with oblong holes,

said outlet being coaxial and coextensive with said bore,

said piston means in its movement between the first and the second position gradually opening or closing the inlets to increase or reduce the rate of flow through said inlets to said outlet,

said piston means comprising first and second axially spaced piston portions, confined for sealed slidable movement in said cylindrical bore,

said piston portions provided with O-ring seals,

said piston means comprising a stem on which said first and second piston portions are secured,

said stem being of smaller diameter than said first and second piston portions,

said stem having an inlet between said first and second piston portions and a central flow passage bored axially in said stem and communicating with said outlet.

4,286,624

FLUID HANDLING SYSTEMS & MULTI-POSITIONABLE VALVING ARRANGEMENTS FOR THE USE THEREIN

Eivind Clausen, 2614 Kentucky St.; Benton H. Amos, 2427 Vista Dr., and William M. Wood, 231 N. State St., all of Bellingham, Wash. 98225

Filed Feb. 25, 1980, Ser. No. 124,070

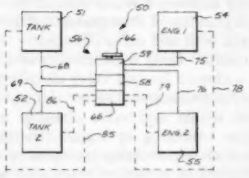
Int. Cl.³ F16K *11/02, 11/20*

U.S. Cl. 137—625.19 **23 Claims**

1. A fluid control valve system comprising, in combination:

(a) valve housing means: said valve housing means having a first and x (where "x" is any whole integer less than "3") second coaxial body portions secured together in end-to-end abutting relation; n (where "n" is any whole integer greater than "1") fluid source supply inlet ports and n fluid source return outlet ports formed in one of said first body portion and said x second body portion(s) and adapted to be operatively connected to respective different ones of n fluid source means; m (where "m" is only whole integer greater than "1") fluid utilization supply outlet ports and m fluid utilization return inlet ports formed in the other of said first body portion and said x second body portion(s) and adapted to be operatively connected to respective different ones of m fluid utilization means; longitudinally extending first passageway means formed in said one body portion(s) corresponding in number to, and respectively interconnected in fluid transmitting relationship with respective different ones of each of, said n fluid source supply inlet and return outlet ports; said first passageway means terminating in the end wall(s) of said one body portion(s) secured in end-to-end abutting relation to said other body portion(s) at points equi-distant from an axis extending longitudinally through said first and x second body portions; and, second passageway means formed in said other body portion(s) corresponding in number to, and respectively interconnected in fluid transmitting relationship with respective different ones of each of, said m fluid utilization supply outlet and return inlet ports;

(b) selectively positionable valve control element means mounted in said valve housing means: said valve control element means comprising x rotatable closure disk(s) respectively mounted between said first body portion and each of said x second body portion(s); at least one of said



first body portion and said x second body portion(s) being recessed to receive said disk(s) while permitting said first and said x second body portions to be secured together in end-to-end abutting relation; means formed in one of said x disk(s) and said other body portion(s) for interconnecting all of said second passageway means with one another; and, longitudinally extending third passageway means formed in and extending through said x disk(s); said third passageway means being coupled in fluid transmitting relation with said means interconnecting all of said second passageway means and being equi-distant with said first passageway means from said axis so as to permit selective coupling of one of said first passageway means to all of said second passageway means whereby fluid paths are completed through said fluid control valve system from one of said n fluid source supply inlets to all of said m fluid utilization supply outlets and from all of said m fluid utilization return inlets to one of said n fluid source return outlets; and,

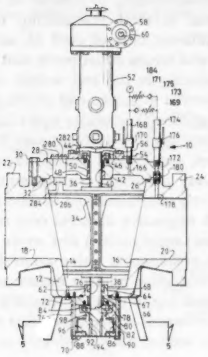
(c) selector means coupled to said x disk(s) for rotating the latter so as to align said third passageway means with selected ones of said first passageway means whereby one of said n fluid source supply inlet ports is operatively connected to supply fluid to all of said m fluid utilization supply outlet ports and all of said m fluid utilization return inlet ports are operatively connected to return fluid to one of said n fluid source return outlet ports.

4,286,625

FOUR-WAY PLUG VALVE

Jerry B. Tomlin, Sugar Land, and Herbert H. Hodgeman, Houston, both of Tex., assignors to Daniel Industries, Inc., Houston, Tex.

Filed Apr. 18, 1979, Ser. No. 31,219
Int. Cl.³ F16K *5/16, 11/083, 39/06*
U.S. Cl. 137—625.43 **19 Claims**



1. A rotary lift-turn type diverter valve mechanism for controlling the flow of fluid, said valve mechanism comprising:

a valve body defining a frusto-conical valve chamber and defining a plurality of flow passages disposed in intersecting relation with said valve chamber;

a bonnet structure being connected to said valve body and defining a closure for said valve chamber;

a generally frusto-conical diverter element being movably positioned within said valve chamber and including a valve stem extending in sealed relation through said bonnet and a trunnion being journaled by said valve body and positioned in coaxial relation with said valve stem, said diverter element cooperating with said valve body to define flow passage means;

adjustable diverter positioning means being provided by said valve mechanism;

diverter positioning means being provided on said diverter element and cooperating with said adjustable diverter positioning means for precisely orienting said plug element with respect to said inlet and outlet passages said adjustable diverter positioning means being selectively positionable to correct for minor misalignment of said diverter element with respect to said flow passage means; and

valve actuator means being connected to said valve body and operatively engaging said valve stem, said valve actuator means being capable of imparting both linear and rotary components of movement to said valve stem during operation for unseating, rotating and reseating said diverter element within said valve chamber.

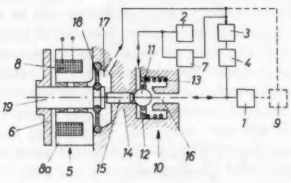
4,286,626

MAGNETIC VALVE

Heinz Leiber, Leimen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 14, 1979, Ser. No. 39,033
Claims priority, application Fed. Rep. of Germany, May 20, 1978, 2822142
Int. Cl.³ F16K *31/06*
U.S. Cl. 137—625.65 **8 Claims**

1. A magnetic valve including a housing and an electromagnet having an armature housed in a chamber in said housing which is not infiltrated by a pressure medium to be controlled, a high-pressure chamber arranged to be connected with a source of relatively high pressure and an intermediate-pressure chamber located between said high-pressure chamber and said electromagnet, a wall having a passageway opening between said high-pressure chamber and said intermediate-pressure chamber, a low-pressure chamber subjected to relatively low pressure, said intermediate-pressure chamber communicating with said low-pressure chamber, a rod coupling connected to said armature of the electromagnet, a separate auxiliary rod positioned in said passageway opening in said wall between said rod coupling and said high-pressure chamber, a sealing apparatus for sealing the passageway opening in said wall containing said auxiliary rod from said high-pressure chamber, said passageway opening and said auxiliary rod being so dimensioned that only a small flow of pressure medium flows



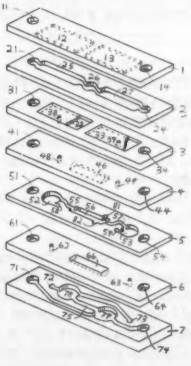
from said high-pressure chamber to said intermediate pressure chamber along the auxiliary rod whereby the pressure drop at said passageway opening between said high-pressure chamber and said intermediate-pressure chamber constitutes the greatest share of the pressure difference between high-pressure chamber and said low-pressure chamber, a membrane secured to said rod coupling and to said valve housing for sealing off the entry of said rod coupling from the electromagnet side into said intermediate-pressure chamber, said sealing apparatus including a closure part arranged to be actuated by said auxiliary rod whereby, in one position of said magnetic valve, said closure part is actuated by said auxiliary rod and permits a flow of pressure medium from the source of relatively high pressure to said intermediate pressure chamber.

4,286,627

VORTEX CHAMBER CONTROLLING COMBINED ENTRANCE EXIT

Ronald E. Graf, Rte. 3, Box 520, Crozet, Va. 22932

Division of Ser. No. 752,983, Dec. 21, 1976, abandoned. This application Oct. 25, 1978, Ser. No. 954,327
Int. Cl.³ F15C *1/16*
U.S. Cl. 137—810 **1 Claim**



1. A device comprising a first component, said first compo-

nent being a chamber having an axis of substantial circular symmetry,

said chamber having at least one first type fluid connection acting as an exit for working fluid from said chamber and being located on the axis of substantial circular symmetry of said chamber, working fluid being defined as that type of fluid of which some travels through said chamber and out again during operation of said device,

said chamber having at least one second type fluid connection acting as an entrance for working fluid to said chamber, said second type fluid connections each being placed so that working fluid enters at a place away from said axis and being so oriented that working fluid entering at said second type fluid connections and exiting from said chamber at said first type fluid connections will cause a fluid circulation about said axis within said chamber, the circulation and resultant centrifugal forces in turn being the predominant cause of a pressure drop from said second type fluid connections to said first type fluid connections,

said chamber having at least one third type fluid connection acting for working fluid both as an entrance at times to said chamber and as an exit at some other times from said chamber, said third type fluid connections being located substantially away from said axis of substantial circular symmetry, said third type fluid connections being oriented so that, in the absence of other flow, working fluid entering said chamber at said third type fluid connections and exiting from said chamber at said first type fluid connections travels through said chamber without circulation about said axis,

said device further comprising a second component containing a cavity, said second component comprising at least one movable mass, part of the surface of said movable mass comprising one wall of said cavity, the volume of said cavity changing when said movable mass moves, the volume of said cavity being non-zero for most, if not all, positions of said movable mass, which said cavity communicates, through at least one opening in said cavity, whenever its volume is within a given range representing more than half the total range of volumes attained during operation of said device, in the sense of being able to exchange working fluid, with said first component by way of said at least one third type fluid connection, said movable mass being related to the rest of said second component in such a way that said movable mass substantially blocks entrance and exit of working fluid with respect to said cavity at said mass, whenever the volume of said cavity is within said given range, the blocking of working fluid being enough to be effective so that, during normal operation of the device, when the movable mass moves to sufficiently reduce the volume of said cavity within the said given range then working fluid is expelled, by motion of the movable mass, from said cavity at said at least one opening communicating with [illegible] third type fluid connection.

4,286,628

CONTROL OF FLUID FLOW USING LONGITUDINALLY MOVABLE DISC

Joseph R. Paradis, Holden, and Edward W. Kaleskas, Jefferson, both of Mass., assignors to Nypro, Inc., Clinton, Mass.

Filed Jun. 21, 1979, Ser. No. 50,823
Int. Cl.³ F16K *15/14*
U.S. Cl. 137—843 **11 Claims**

1. A flow control device comprising

a housing;

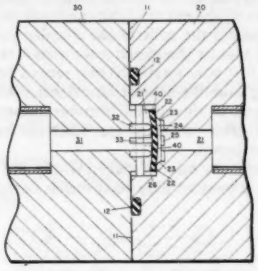
a flow channel in said housing extending to a control channel which is coaxial therewith;

a valve seat in said control channel surrounding a further flow channel extending from said control channel; and

a flexible disc positioned on said valve seat of said control channel,

said control channel having an inside wall surface extending from said valve seat and interrupted by a plurality of peripheral relief channels; and

means for prebiasing said flexible disc comprising a set of prongs for engaging the central portion of said disc within the opening of said valve seat and being separated by passageways which extend to said flow channel;



said valve seat containing a counterbore which extends into said further flow channel, with at least one counterbore channel which is transverse to the axis of flow to insure that said disc will not be pulled into said further flow channel and produce undesired distortion and distension of said disc.

4,286,629

REMOVABLE PLUG

Steven G. Streich, and Lloyd C. Knox, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Dec. 7, 1979, Ser. No. 101,377
Int. Cl.³ F16L *55/10*; E02B *17/00*
U.S. Cl. 138—89 **10 Claims**

1. A removable plug installed on one end of a pipe comprising:

plug housing means comprising:

annular member means having one end thereof secured on one end of said pipe, having first bore means extending from the end of the annular member means secured to one end of said pipe and terminating at a point intermediate the ends of the annular member means, having annular chamfered seat means at the termination of the first bore means, having second bore means extending from the annular chamfered seat means to the other end of the annular member means, having aperture means in the second bore means of the annular member means, and having conical guide means on the other end of the annular member means;

plug body means retained within said plug housing means, said plug body means comprising:

member means having the outer diameter thereof substantially the same diameter as the second bore means of said plug housing, having annular channel means in the outer periphery thereof containing seal means therein, having additional annular channel means in the outer periphery thereof, having aperture means therein, having attachment means retained within the aperture means extending on each side of said plug body means, and having annular chamfered seat means thereon which mates with the annular chamfered seat means of said plug housing means when said plug body means is installed therein; and

fastening means releasably retaining said plug body means within said plug housing means, said fastening means comprising:

shear type fastening means having a portion thereof retained within the aperture means in the second bore of said plug housing means and having a portion received within the additional annular channel means of said

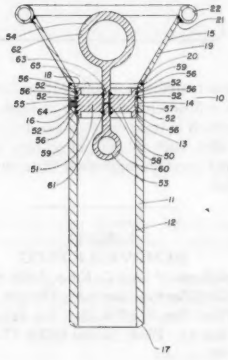
plug body means when said plug body means is installed in said plug housing means.

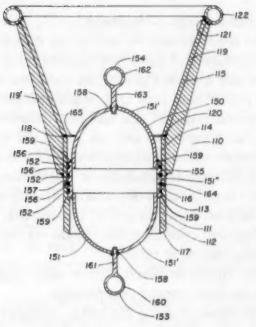
10. A removable plug installed on one end of a J-tube of an offshore platform or marine structure comprising:

plug housing means, said plug housing means comprising:

annular member means having first bore means extending from the end of the annular member means secured to one end of said end of a J-tube and terminating at a point intermediate the ends of the annular member means, having annular chamfered seat means at the termination of the first bore means, having second bore means extending from the annular chamfered seat means to the other end of the annular member means, and having conical guide means on the other end of the annular member means;

buoyant plug body means retained within said plug housing means, said buoyant plug body means comprising:





buoyant member means including end means interconnected by intermediate member means extending therebetween thereby forming a buoyant member means having a fluid free buoyant chamber therein, the buoyant member means having the outer diameter thereof substantially the same diameter as the second bore means of said plug housing, having annular channel means in the outer periphery thereof containing seal means therein, having additional channel means in the outer periphery thereof, having aperture means therein, having attachment means retained within the aperture means extending on each side of said buoyant plug body means, and having annular chamfered seat means thereon which mate with the annular chamfered seat means of said plug housing means when said buoyant plug body means is installed therein; and

fastening means releasably retaining said buoyant plug body means within said plug housing means, said fastening means comprising:

shear type fastening means having a portion thereof received within the aperture means of the second bore of said plug housing means and having a portion thereof received within the additional channel means of said buoyant plug body means when said buoyant plug body means is installed within said plug housing means.

4,286,630

SURFACE DUCTING

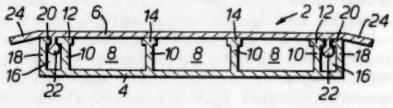
George T. Happer, London, United Kingdom, assignor to Happer Systems Limited, London, England

Filed Jul. 23, 1979, Ser. No. 59,613

Claims priority, application United Kingdom, Jul. 25, 1978, 31017/78

Int. Cl.[3] **H02G** *3/04, 3/28*

U.S. Cl. 138—92 **10 Claims**



1. Surface ducting comprising a body portion and a removable lid, the body portion having a base, first longitudinal channels defined by longitudinally extending ribs which are upstanding from the base, and a pair of second longitudinal channels which are arranged one on each side of the first channels and which are each defined by a side wall of the body portion and one of the ribs, said side wall of the body portion being upstanding from the base and forming an outside of the second longitudinal channels, the first and second longitudinal channels being of the same height, the first channels being for receiving elongate members, the second channels being narrower than the first channels and extending the full distance from the lid to the base so as to be capable of accomodating fixing means extending from the lid to the base for fixing the lid to the base via the second longitudinal channels while not interfering with the first longitudinal channels, and the lid having integrally formed retainer means for clipping in the second longitudinal channels.

4,286,631

METHOD OF PROVIDING A SEAM IN DOUBLE-LAYER FORMING FABRICS

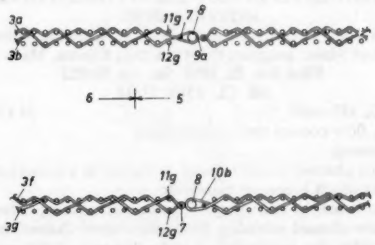
Ingvald Strandly, Brettevillesgate 15, Oslo 4, Norway

Continuation-in-part of Ser. No. 943,118, Sep. 8, 1978, Pat. No. 4,206,787. This application Oct. 23, 1979, Ser. No. 87,695

Claims priority, application Sweden, Jul. 5, 1977, 7707787

Int. Cl.[3] **D03D** *15/00*

U.S. Cl. 139—383 A **3 Claims**



1. A method of providing a row of loops at each end of a

weave, said weave comprising two layers of weft threads with the threads positioned in pairs substantially one above the other, warp threads interconnecting said weft layers, and a locking wire intended to interconnect said rows of loops to form an endless fabric web, the method comprising:

removing permanently the weft threads in a first zone closest to one end edge of said weave;

removing temporarily the weft threads in a second zone adjacent said first zone;

arranging said temporarily removed weft threads, alternatively a corresponding number of weft threads, together with one coarse folding wire and also one or several thin folding wires as a warp wherein said coarse wire temporarily replaces said locking wire intended finally to interconnect the two weave ends,

where two warp thread ends in succession in accordance with the pattern repeat weave between the threads of the outermost one of said pairs in said second zone of weft threads, carrying one of said warp thread ends, after having woven said warp thread end into said second zone of weft threads in accordance with the correct weaving pattern, in a loop around said thin folding wire (or wires) as well as around said coarse folding wire and thereafter carrying said warp thread end in the reverse direction in the position of said second warp thread to a pick-up point in said second zone of weft threads, at which point said two warp threads meet,

where at least two of three consecutive warp thread ends according to the pattern repeat weave between the threads of the outermost pair of said second zone of weft threads, one of these warp thread ends after having been woven according to the pattern into said second zone of weft threads is carried in a loop about the thin folding wire (or wires) as well as the coarse folding wire and then back in the place of one of the other warp threads to a pick-up point in the said second zone of weft threads, at which point the two warp threads meet each other whereas the third warp thread after having been woven according to the pattern into said second zone of weft threads is carried to a pick-up point in connection with the outermost pair of weft threads of said second zone of weft threads;

where two subsequent warp thread ends in accordance with the pattern repeat weave over and below, alternatively below, the threads of the outermost one of said pairs in said second zone of weft threads, carrying one of said warp thread ends, after having woven said warp thread end into said second zone of weft threads in accordance with the correct weaving pattern, around said outermost pair of weft threads and the thin folding wire or wires and thereafter carrying said warp thread end in the reverse direction in the position of said second warp thread to a pick-up point in said second zone of weft threads, at which place said two warp threads meet;

where at least two of three succeeding warp thread ends according to the pattern repeat weave over and below, alternatively below, the threads of the outermost pair of said second zone of weft threads, one of these weft threads, after having been woven into said second zone of weft threads in correct pattern, weaves about said outermost pair and the thin folding wire (or wires) and then back in the place of one of the other warp threads to a pick-up point in said second zone of weft threads, at which point the two warp threads meet, whereas the third warp thread end after having been woven into said second zone of weft threads in correct pattern is carried to a pick-up point in connection with the outermost pair of weft threads,

where one warp thread end in accordance with the pattern repeat weaves between, alternatively above or below, the threads of the outermost one of said pairs in said second zone of weft threads without being followed by a warp thread end having the same alternative weaving pattern, carrying said warp thread end, after having woven said warp thread end in accordance with the correct weaving pattern into said second zone of weft threads, around said outermost pair of weft threads and said thin folding wire or wires to a pick-up point adjacent to said outermost pair of weft threads, and

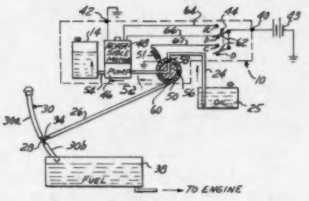
treating said warp thread ends at both edges of said weave in the same manner and preferably simultaneously, said coarse folding wire being common to said warp thread ends of both fabric end edges.

4,286,632

FUEL-LUBRICATING OIL PROPORTIONER AND MIXER

Donald J. Abel, Bradenton, Fla., assignor to David Albert, Tampa, Fla.

Filed Sep. 19, 1979, Ser. No. 76,946
Int. Cl.³ B65B *3/02*
U.S. Cl. 141—18 **8 Claims**



8. A fuel-lubricating proportioner and mixer for discharge into a fuel tank, comprising in combination:

a lubricating oil reservoir;

a graduated lubricating oil measuring container;

a reversible pump connected to said measuring container;

two-way valve means;

first conduit means interconnecting said valve means and said pump;

second conduit means interconnecting said oil reservoir and said valve means;

third conduit means interconnecting said valve means and the fuel tank;

means for controlling the position of said valve means enabling said pump to convey a measured quantity of oil from said oil reservoir to said measuring container when said valve means is in a first position and said reversible pump is moving in a first direction and for enabling said pump to convey said measured quantity of oil from said oil reservoir to the fuel tank when said valve means is in a second position and said reversible pump is moving in a second direction.

4,286,633

DROPPER ASSEMBLY

James E. Herr, East Petersburg, Pa., assignor to Kerr Glass Manufacturing Corporation, Los Angeles, Calif.

Filed Sep. 12, 1979, Ser. No. 74,905
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—24 **8 Claims**

8. A combination of a bottle and a child resistant bottle closure-dropper assembly comprising;

a bottle with a hollow interior and a mouth with thread means therearound;

and a closure dropper assembly comprising;

an outer cap with a top end wall and a skirt depending therefrom;

an inner cap concentric with said outer cap with a top end wall and a skirt depending therefrom, thread means on an inside wall of said skirt of said inner cap to engage with said thread means on said bottle;

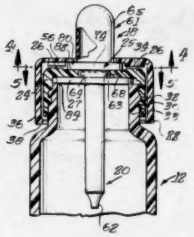
ratchet means on said caps positionable in a driving position for driving engagement to rotate said inner cap with said

outer cap when said outer cap is rotated in an application direction and positionable in a non-driving position to allow said inner cap to remain stationary when said inner cap is engaged with said bottle and said outer cap is rotated in a removal direction;

interlocking members on said caps having driving engagement to rotate said inner cap with said outer cap when said outer cap is rotated in the removal direction;

orifices in the center of each of said top end walls of said caps;

a bulb of resilient material with an opening to receive a syringe therein, a nipple, and a compressible portion, said



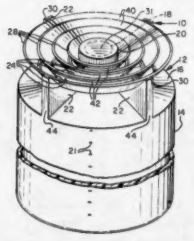
bulb extending through said orifices with said compressible portion disposed between said top ends and spacing said first interlocking member from said second interlocking member when said compressible portion is not compressed but allowing said interlocking members to engage when a downward force is applied to said outer cap compressing said portion, thereby allowing said bottle closure-dropper assembly to be removed from said bottle by applying a simultaneous downward force and rotational torque in the removal direction on said outer cap, compression of said compressed resilient portion biasing said outer cap to shift upwardly to space said interlocking members to prevent closure removal by a child.

4,286,634

SAMPLE CONTAINER WITH COLLAPSIBLE FUNNEL

Elizabeth M. Wisner, P.O. Box 1336, Depot Bay, Oreg. 97341

Filed Oct. 10, 1979, Ser. No. 83,352
Int. Cl.³ B65B *39/02*; B67C *11/02*
U.S. Cl. 141—95 **8 Claims**



1. A sample container, comprising:

(a) a body having a generally horizontal bottom and a side wall connected thereto;

(b) a top connected to said side wall, said top including an upwardly extending neck having an upwardly open mouth, and a sloping top surface extending downward from said neck toward said side wall;

(c) a collapsible funnel attached to said neck for guiding fluid through said mouth into said neck, said funnel comprising a plurality of interlockable, telescopically overlapping frusto-conical rings having respective top edges;

(d) support means attached to said top, for holding said frusto-conical rings; and

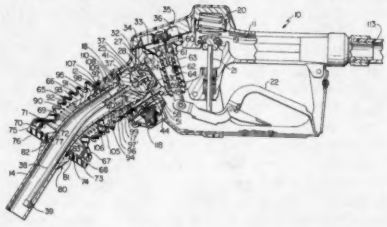
(e) said support means comprising at least three upstanding support members spaced about said top, each of said upstanding support members defining a plurality of notch means therein for receiving and supporting said frusto-conical rings atop said container, wherein the respective top edges of at least some of said rings define a substantially planar horizontal surface for supporting an object such as a similar container stacked thereon when said funnel is in a collapsed configuration.

4,286,635

AUTOMATIC SHUT-OFF NOZZLE HAVING AN ARRANGEMENT FOR CONTROLLING WHEN AUTOMATIC SHUT OFF OCCURS IN RESPONSE TO PRESSURE IN A SEALED TANK

Jack A. McMath, Fort Thomas, Ky., assignor to Dover Corporation, New York, N.Y.

Continuation of Ser. No. 917,911, Jun. 22, 1978, abandoned, which is a continuation-in-part of Ser. No. 811,551, Jun. 30, 1977, abandoned. This application Sep. 20, 1979, Ser. No. 77,332
Int. Cl.³ B65B *3/18, 57/14*
U.S. Cl. 141—98 **26 Claims**



1. An automatic shut-off nozzle comprising a body having an inlet and an outlet, a valve in said body controlling flow of liquid from said inlet to said outlet, manual operated means controlling the operation of said valve, a spout communicating with said outlet and having its free end for disposition in an opening of a fill pipe of a vehicle tank or the like, release means to release said manual operated means to allow closing of said valve and stoppage of liquid flow, means to return vapor from the tank being filled, sealing means to form a seal between the fill pipe opening and said vapor return means when said spout is disposed in the fill pipe, responsive means responsive to the pressure in the sealed tank to cause said release means to close said valve to stop liquid flow through said body when the pressure in the sealed tank exceeds a predetermined pressure, means exerting a force on said responsive means in opposition to the pressure in the sealed tank acting on said responsive means, and force control means to control the force exerted by said exerting means on said responsive means to cause said responsive means to respond at the predetermined pressure.

4,286,636

DIP TUBE AND VALVE WITH QUICK-DISCONNECT COUPLING FOR A COLLAPSIBLE CONTAINER

William S. Credle, Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

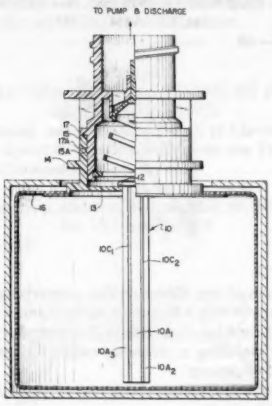
Filed Jul. 19, 1979, Ser. No. 58,866
Int. Cl.³ B67C *5/00*
U.S. Cl. 141—114 **23 Claims**

1. A dip tube for use in combination within a collapsible container and suction means for withdrawing a liquid product from the collapsible container, the improvement comprising:

an elongated dip tube positioned within said collapsible

container for permitting a liquid product disposed within said collapsible container to be withdrawn therefrom by said suction means;

said elongated dip tube including at least one substantially straight channel in the peripheral surface thereof extending along substantially the entire length of said dip tube and at least one longitudinal interior passage through the



entire length of said dip tube, said at least one straight channel communicating along the entire length thereof with said at least one longitudinal interior passage;

whereby said collapsible container progressively collapses around said dip tube sealing a portion of said channel while the remaining open portion of said channel permits the complete withdrawal of liquid product disposed within said collapsible container.

4,286,637

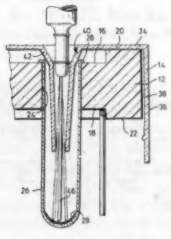
APPARATUS FOR DISPENSING LIQUIDS INTO TUBES

Strathearn Wilson, King City, Canada, assignor to Connaught Laboratories Limited, Willowdale, Canada

Continuation-in-part of Ser. No. 959,008, Nov. 9, 1978, abandoned. This application Jul. 31, 1980, Ser. No. 174,203

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—374 **8 Claims**



1. In combination,

an elongate dispensing member for dispensing liquids;

a guide apparatus for use in conjunction with said elongate dispensing member in connection with the dispensing of liquids therefrom,

liquid receiving means of confined dimension located below said guide apparatus for receiving said dispensed liquids;

said guide apparatus comprising:

a planar plate-like member having longitudinal and lateral extremities and positioned substantially horizontally in use,

planar wall members depending from each of said longitudinal and lateral extremities and terminating in a plane parallel to and downwardly spaced from said plate-like member,

a plurality of guide means integrally formed with said plate-like member and comprising tubular members extending in tapering fashion from one open end at said plate-like member towards said plane and terminating in another open end at a location upwardly spaced from said plane and from said liquid receiving means,

each of said tubular guide means being in substantial alignment with one of said liquid-receiving means and being dimensioned to permit said elongate dispensing member to be supported thereby and to extend through said another open end to permit liquid to be dispensed from said dispensing member to said liquid receiving means.

4,286,638

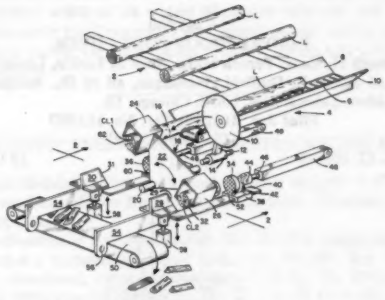
APPARATUS FOR MEASURING, CUTTING AND SPLITTING LOGS

Bruce Connolly, and J. Bruce Bradicich, both of c/o Forest-All Corporation, Sheep Davis Rd., Concord, N.H. 03301

Filed Feb. 13, 1980, Ser. No. 121,058

Int. Cl.³ B27L *7/00*

U.S. Cl. 144—3 K **13 Claims**



12. A machine for producing short lengths of split lumber, said machine comprising,

means for advancing a log step by step in an axial direction for a predetermined distance,

a transversely movable saw for cutting off a succession of short logs of selected length from the end of said log when said log is stationary,

two laterally spaced log splitters, and

means for receiving the end of said log prior to cutting and for carrying said successively cut short logs alternately to said splitters.

4,286,639

THIN WALLET CARRYING CASE FOR A SANITARY NAPKIN OR TAMPON

Jeannie P. Murphy, 2330 Good Hope Rd. SE., Apt. 904, Washington, D.C. 20020

Filed Apr. 30, 1980, Ser. No. 145,106

Int. Cl.³ B65D *30/24, 39/00*

U.S. Cl. 150—7 **7 Claims**

1. A generally elongated rectangular flexible flat wallet-like carrying case produced from a single sheet comprising:

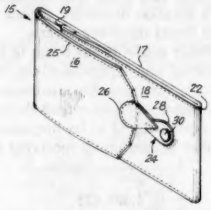
(a) an adjacent single sheet thickness front and back panel formed by folding one end of said single sheet over and adjacent a portion of the remainder of said single sheet, forming two layers in flat contiguous relation,

(b) means securing said panels together at opposing side

edges and open at the top to form a single pocket between said front and back panels,

(c) said back panel being folded adjacent to the open pocket so as to be flat on top of the front panel to define a long flexible closure flap with respect to the width of the carrying case,

(d) releasable fastening means extending beyond and overlying the mid-portion of the pocket for securing said closure flap in closed position,



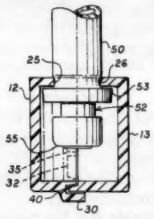
(e) said open pocket under said closure flap providing means for insertion and withdrawal of a tampon or sanitary napkin held between and by the layers formed by the front and back panels in flat condition, preventing attention being directly called to opening and closing operation of the closure flap as part of the use to which said tampon or sanitary napkin is to be put.

4,286,640

TAMPERPROOF PORT COVER

Kenneth H. Knox, Vernon Hills; Mark E. Larkin, Lindenhurst, and James R. Duffield, Waukegan, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Jan. 21, 1980, Ser. No. 113,887
Int. Cl.³ B65D *55/02*
U.S. Cl. 150—8 **13 Claims**



1. A protective cover for the port of a container for medicinal liquids, said port defining flexible side and end walls comprising:

first and second body members defining side and opposing end walls adapted to partially surround said port side and end wall;

hinging means extending between adjacent wall portions of said first and second members to interconnect said members;

said first and second body members defining oppposing end walls presenting port-engaging surfaces at one end of each said member and a closed wall at the other end;

tamperproof frictional engagement means operatively associated with adjacent wall portions of said first and second body members opposite said hinging means providing a snapfit arrangement;

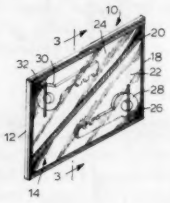
said port engaging surfaces and said frictional engagement means of said first and second body members constructed and arranged so that when said first and second members are placed over said side and end walls of said port and said frictional engagement means are activated, said resilient side wall of said port will exert a biasing force on said port engaging surface to maintain said frictional engagement means under tension.

4,286,641

COMBINATION BUSINESS CARD AND KEY STORAGE DEVICE

Joe L. Watson, 4602 Okeechobee, Fort Pierce, Fla. 33450

Filed Nov. 13, 1979, Ser. No. 93,374
Int. Cl.³ A45C *11/42*
U.S. Cl. 150—40 **5 Claims**



1. An improved key holder device, comprising:

an enclosure having a first outer surface and a second outer surface joined together around their periphery, one of said surfaces including a receiving means for inserting a key into said enclosure;

said enclosure including at least two substantially rectangular flexible sheets;

said substantially rectangular flexible sheets including a first seal around the peripheral edges of said substantially rectangular flexible sheets and a second seal along a diagonal of said substantially rectangular flexible sheets dividing said first outer surface into a first substantially triangular compartment and a second substantially triangular compartment;

said first substantially triangular compartment and said second substantially triangular compartment each having a wide end and a narrower end;

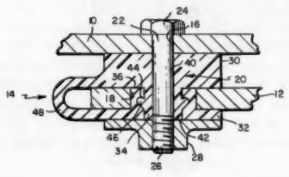
said receiving means including a slit formed in the wide end of at least one of said substantially triangular compartments.

4,286,642

ISOLATION CONNECTION

James Keatley, Granada Hills, Calif., assignor to Barry Wright Corporation, Watertown, Mass.

Filed Apr. 9, 1979, Ser. No. 28,129
Int. Cl.³ F16B *37/04*
U.S. Cl. 411—112 **4 Claims**



1. An isolation connection for minimizing transmission of vibration and noise from one part to another, said isolation connection comprising in combination: first and second parts having opposing surfaces with aligned holes therethrough, an isolation fastener element inserted through the holes with retaining means at its ends and an interposable integrally-constructed system of elastomeric material comprising (A) a first elastomeric body disposed about the portion of the element between the parts, said first elastomeric body being mounted on and between the opposing surfaces of the parts so as to have

elastomeric material confronting each of the parts, (b) a second elastomeric body disposed about the element and between the retaining means at one end and the part confronted by the retaining means so as to have elastomeric material confronting said part and said retaining means at one end, and (c) elastomeric protrusions extending from the respective elastomeric bodies into the hole in the part embraced between the elastomeric bodies and about the portion of the element extending through said hole, said protrusions embodying means interlocking one elastomeric body with the other.

4,286,643

PNEUMATIC TIRE HAVING A LINING OF PUNCTURE SEALING PRODUCT

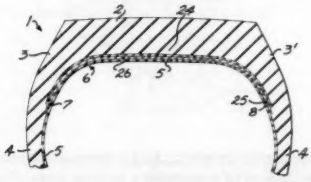
Andre Chemizard, and Max Blanc, both of Clermont-Ferrand, France, assignors to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed May 1, 1979, Ser. No. 34,965

Claims priority, application France, May 10, 1978, 78 14113

Int. Cl.³ B60C *21/08*

U.S. Cl. 152—347 **3 Claims**



1. A tire whose inner wall is covered, at least in the zone of the crown and of the shoulders, with a self-sealing product which is pasty at the temperature of the tire in service and which, seen in meridian section, is contained between two layers of elastomer and is divided transversely by partitions of elastomer, characterized by the fact that the self-sealing product forms at least one continuous ribbon having a parallelogram cross section, one end of which is located in the region of one shoulder while the other end is located in the region of the other shoulder of the tire, the transverse partitions of elastomer having an angle of inclination of between about 30° and about 50°.

4,286,644

REPLACEABLE TREAD TIRES

James W. Pond, Jr., Doylestown, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 905,252, May 12, 1978, abandoned. This application Feb. 11, 1980, Ser. No. 120,020

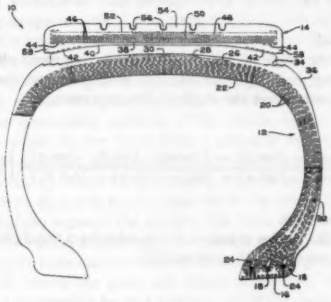
Int. Cl.³ B60C *11/02*

U.S. Cl. 152—354 R **1 Claim**

1. A pneumatic tire assembly including:

a generally toroidal carcass portion having axially spaced beads, radially outwardly extending sidewalls, a crown section and carcass shoulders intermediate the sidewalls and crown section, said carcass shoulders being built-up and enlarged with respect to said crown section, said carcass having high angle bias ply cords of about 75° with respect to the intended direction of tire rotation and extending from bead to bead and defining an ovate cross-sectional configuration with a relatively flat, continuous, upper surface extending entirely across the crown and carcass shoulders to define a tread receiving area, and

a generally cylindrical replaceable tread portion removably mounted upon the upper surface of said carcass portion, said tread portion having a central area and tread shoulders extending from the edges of the tread portion, said tread shoulders being built-up and enlarged with respect to the rest of the tread portion, said tread portion also including a plurality of layers of ply cords extending entirely across said tread portion at 0° from the intended direction of tire rotation, the tread portion defining an axially elongated cross-sectional configuration with a relatively flat, continuous radially inner surface across its entire width to constitute an area for mounting upon the tread receiving area of said carcass portion with the carcass shoulders in overlying contact with said tread shoulders and with the interface of said carcass portion and said tread portion defining in cross-section a radius of curvature of from about 500% to infinity of the inflated carcass section width at its widest dimension whereby said replaceable tread portion is maintained on said carcass portion during use by inflation pressure within said carcass portion.



4,286,645

PNEUMATIC TIRE WITH REINFORCED CARCASS AND TREAD

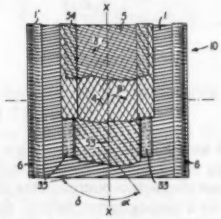
Jacques Boileau, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Continuation of Ser. No. 748,498, Dec. 8, 1976, abandoned, which is a continuation-in-part of Ser. No. 650,665, Jan. 20, 1976, abandoned, which is a continuation of Ser. No. 476,443, Jun. 5, 1974, abandoned. This application Jun. 20, 1979, Ser. No. 50,309

Claims priority, application France, Jun. 12, 1973, 73 21397; Mar. 11, 1976, 76 07055

Int. Cl.³ B60C *9/20, 9/04*

U.S. Cl. 152—360 **10 Claims**



1. A cylindrical blank for the one-step manufacture of a pneumatic tire characterized by the fact that it comprises at least one carcass ply having cords which are continuous from one bead to the other and which form a substantially constant angle of between 70° and 90° with respect to the circumferential direction, as well as a tread reinforcement consisting essentially of three tread plies radially outside the carcass ply adjacently superimposed on one another and on the carcass ply and having cords whose respective cord angles α, β and γ are such

that, α being the angle of the cords of the tread ply nearest the carcass ply,

when the angles β and γ of the other two tread plies are of opposite sign and when in absolute value the angle β is greater than the angle γ, the expression

$$\left| \frac{|\tan\beta| - |\tan\gamma| - 2|\tan\alpha| \cdot |\tan\beta| \cdot |\tan\gamma|}{2|\tan\beta| \cdot |\tan\gamma| + |\tan\alpha|(|\tan\beta| - |\tan\gamma|)} \right| \leqq 0.6$$

is satisfied;

when the angles β and γ of the other two tread plies are of the opposite sign and when, in absolute value, the angle γ is greater than the angle β, the expression

$$\left| \frac{|\tan\gamma| - |\tan\beta| - 2|\tan\alpha| \cdot |\tan\beta| \cdot |\tan\gamma|}{2|\tan\beta| \cdot |\tan\gamma| + |\tan\alpha|(|\tan\gamma| - |\tan\beta|)} \right| \leqq 0.6$$

is satisfied; and

when the angles β and γ of the other two tread plies are of the same sign, the expression

$$\left| \frac{|\tan\beta| + |\tan\gamma| - 2|\tan\alpha| \cdot |\tan\beta| \cdot |\tan\gamma|}{2|\tan\beta| \cdot |\tan\gamma| + |\tan\alpha|(|\tan\beta| + |\tan\gamma|} \right| \leqq 0.6$$

is satisfied,

whereby said three tread plies can be expanded radially and said cylindrical blank can be reshaped to a substantially toroidal shape, notwithstanding the positioning thereon of said three tread plies.

4,286,646

METHOD FOR INOCULATING OR REFINING METAL MELTS

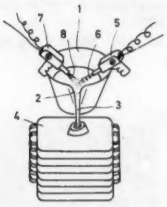
Horst Beyer, Burscheid, Fed. Rep. of Germany, assignor to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Feb. 21, 1979, Ser. No. 13,288

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1978, 2807527

Int. Cl.³ B22D *27/00*

U.S. Cl. 164—57.1 **4 Claims**



1. In a method for inoculating or refining a metal by introducing an additive into a melt of the metal under high kinetic energy and wherein the melt is poured in the form of a stream from a crucible via a casting spout thereof, the improvement wherein said step of introducing is carried out with a magnesium or a magnesium alloy additive in molten form by blowing the molten additive into the melt stream with a carrier gas while the melt is being poured, at the location of the casting spout, by forming a spray of the molten additive with the carrier gas, which spray is laterally unrestricted, to dissolve the additive immediately into the metal melt in uniform dispersion, said melt being poured from the crucible into a stacked sand casting mold to produce piston rings and the composition of the melt being such as to produce cast iron piston rings containing spheres of graphite.

4,286,647

APPARATUS FOR PREVENTING STEAM EXPLOSION IN WATER DISCHARGE CHANNEL OF SECONDARY COOLING ZONE CAUSED BY MOLTEN METAL BREAKING OUT FROM CAST STRAND IN HORIZONTAL TYPE CONTINUOUS CASTING MACHINE

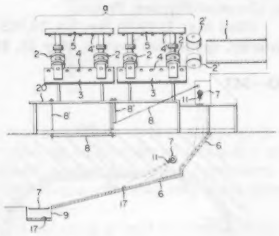
Akira Honda, Kamakura; Kiyomi Taguchi, Fukuyama; Masayuki Hanmyo, Fukuyama; Masaru Ishikawa, Fukuyama, and Minoru Kitamura, Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1980, Ser. No. 160,596

Claims priority, application Japan, Jul. 9, 1979, 54/85844

Int. Cl.³ B22D *11/124*

U.S. Cl. 164—153 **5 Claims**



1. An apparatus for preventing a steam explosion in a water discharge channel of a secondary cooling zone of a horizontal type continuous casting machine, caused by molten metal breaking out from a cast strand, said discharge channel being provided in downward inclination toward the downstream below said secondary cooling zone along said secondary cooling zone, which comprises:

a metal net provided substantially horizontally between said secondary cooling zone and said water discharge channel for granulating said molten metal breaking out from said cast strand;

a water flashing mechanism provided over the entire width of said water discharge channel above said water discharge channel, said water flashing mechanism comprising a plurality of water injection ports for ejecting water on said molten metal granulated through said metal net for rapidly cooling and solidifying said molten metal and washing away the resultant solidified granulated metal toward the downstream of said water discharge channel; and,

a tank provided at the downstream end of said water discharge channel for receiving the water and the granulated metal discharged from said water discharge channel and for separating said granulated metal from said water.

4,286,648

APPARATUS FOR OPERATING AN INJECTION CYLINDER OF A MOLDING MACHINE

Takahiko Takeshima; Motozo Kawashima, and Masayuki Nishimoto, all of Ube, Japan, assignors to Ube Industries, Ube, Japan

Filed Jul. 10, 1980, Ser. No. 168,389

Claims priority, application Japan, Sep. 27, 1979, 54-123166

Int. Cl.³ B22D *17/30*

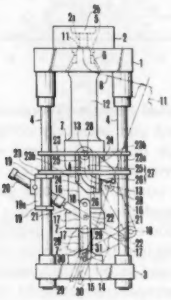
U.S. Cl. 164—312 **8 Claims**

1. In a molding machine of the type comprising spaced apart first and second stationary platens, a stationary die secured to said first platen, a movable die which cooperates with the stationary die to mold molten metal, an injection cylinder disposed between the second stationary platen and the stationary and movable die for driving an injection plunger, and an injection sleeve disposed in front of the injection cylinder, said injection plunger being slidable in said injection sleeve,

wherein the molten metal is injected when axes of the injection cylinder and of the molten metal passage align with each other, and the molten metal is teemed into the injection cylinder when the axis of the injection cylinder is out of alignment with the axes of the stationary and movable dies, an apparatus for moving the injection cylinder between the injection position and the teeming position, which comprises:

a drive means (**20**);

a link mechanism (**16,17**) disposed between a first pin (**13**) on the side of the injection cylinder (**7**) and a stationary second pin (**15**) secured to the second platen (**3**) so as to be expanded and collaped by the drive means (**2**);



a cam plate (**24**) secured to oppose the side of the injection cylinder and including a guide slot (**27**) comprised of a longitudinal slot (**25**) parallel with the axis of the injection cylinder when it is in the injection position and an inclined slot (**26**) contiguous with the longitudinal slot;

a first roller (**28**) secured to the side of the injection cylinder (**7**) to be movable along the guide slot (**27**);

a guide member provided with a slot (**30**) for moving the injection cylinder in the axial direction in the injection position; and

a second roller (**31**) positioned in the slot of the guide member to act as a center of swinging motion of the injection cylinder.

4,286,649

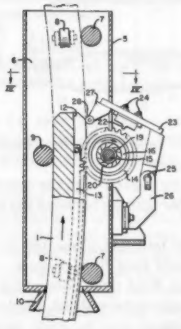
APPARATUS FOR STORING A CONTINUOUS CASTING STARTING BAR IN ELEVATED POSITION

Joseph Rokop, and Nikolaus Rokop, both of Pittsburgh, Pa., assignors to Rokop Corporation, Pittsburgh, Pa.

Filed Jun. 16, 1980, Ser. No. 159,698

Int. Cl.[3] **B22D** *11/08*

U.S. Cl. 164—446 **5 Claims**



1. Apparatus for use with a flow-through continuous casting mold, said apparatus comprising a starting bar curved lengthwise in a vertical plane and having a trailing end for joining to a metal strand issuing from the bottom of such a mold, the leading end portion of said bar being provided with a row of rack teeth extending along the bar for a predetermined distance, a storage housing adapted to be spaced laterally from the mold and having a substantially vertical passage therethrough for receiving said leading end portion of the bar, means for moving the starting bar lengthwise from a strand-receiving position to said storage housing and up into said housing passage, a vertical gear projecting into one side of said housing for engagement by said rack teeth when in said passage, an overrunning clutch operatively connected with said gear permitting the gear to free wheel as said rack teeth move upwardly across the gear a predetermined distance, driving means for controlling rotation of the clutch in the opposite direction when the bar freed from a strand is moving downwardly through said passage and turning said gear, the driving means including means for preventing rotation of the clutch in said opposite direction by said gear while the driving means is idle to thereby support the starting bar from said housing by means of the gear, a latch tooth for meshing with said gear to hold the gear stationary as the downwardly moving uppermost rack tooth leaves the gear, and means supporting said latch tooth and engageable by said leading end of the rising starting bar for disengaging said latch tooth from the gear just before said uppermost rack tooth rising in the housing passage reaches the gear, whereby said uppermost rack tooth will mesh with the gear and start turning it.

4,286,650

METHOD FOR CHARGING OR DISCHARGING A HEAT ACCUMULATOR

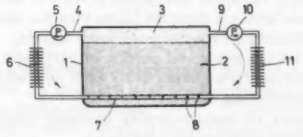
Friedrich Lindner, Stuttgart, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt für Luft- und Roumfabert e.V., Bonn, Fed. Rep. of Germany

Filed Jun. 14, 1979, Ser. No. 48,764

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1978, 2826405

Int. Cl.[3] **F23D** *15/00*

U.S. Cl. 165—1 **5 Claims**



1. A method for charging and discharging a heat accumulator, comprising the steps of

(a) introducing into the accumulator a latent heat-retaining storage medium (**2**) having a first heat condition;

(b) introducing into the accumulator in direct contact with said heat-retaining storage medium a heat exchanger fluid medium having a liquid state; and

(c) introducing a liquid barrier layer between said heat-retaining storage medium and said heat exchanger fluid medium, said liquid barrier layer being immiscible with both said heat-retaining storage and said heat exchange fluid mediums, said barrier layer having a specific weight between the specific weights of said heat-retaining storage medium and said heat exchanger medium, said heat exchanger fluid medium being operable to change said heat-retaining storage medium from said first heat condition to a second heat conditon.

4,286,651

GEOTHERMAL HEATING SYSTEM AND METHOD OF INSTALLING THE SAME

Douglass W. Steiger, and Edward J. Kees, both of Red Lake Falls, Minn., assignors to Environmental Impact Research Group, Red Lake Falls, Minn.

Filed Apr. 28, 1980, Ser. No. 144,257
Int. Cl.[3] F24J 3/02
U.S. Cl. 165—45 3 Claims

1. A geothermal system including a heat pump through which heat exchange liquid is circulated,

a plurality of elongate pipes vertically embedded in the ground so that the major portion of each pipe is located below the frost line, each pipe being closed at its upper and lower ends,

a plurality of anchoring devices, each being secured to the lower end of one of said pipes, each anchoring device including an upper cylindrical portion and a lower conical portion, the upper cylindrical portion of each anchoring device having a diameter larger than the diameter of the associated pipe receiving the latter therein,

means on the lower end portion of each pipe and on said anchoring device interlocking each pipe with the associated anchoring device,

a plurality of interconnecting conduits, each connecting each pipe with an adjacent pipe,

a supply conduit connecting one of said pipes with said heat pump, a return conduit connecting one of said pipes with said heat pump whereby heat exchange liquid will be circulating through the pipes in the heat pump,

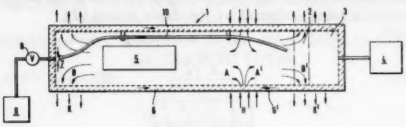
each of said geothermal pipes having an intermediate wall element affixed to the interior thereof to thereby define a geothermal chamber within each geothermal pipe between said intermediate wall element and the closed lower end of the geothermal pipe, each geothermal pipe having an elongate inlet pipe positioned therein having one end thereof connected in communicating relation with a supply conduit and having its other end positioned adjacent the closed lower end of the associated geothermal pipe, and each geothermal pipe having an outlet conduit therein having one end thereof communicating with the upper end of said geothermal chamber and having the other end thereof connected with an interconnecting conduit.

4,286,652

GAS-CONTROLLED HEAT-PIPE THERMOSTAT OF HIGH PRECISION

Claus-Adolf Busse, Arolo di Leggiuno, and Jean-Paul Labrande, Ispra, both of Italy, assignors to Cabinet A. Zewen, Luxembourg-Ville, Luxembourg

Filed Apr. 5, 1976, Ser. No. 673,876
Claims priority, application Luxembourg, Apr. 4, 1975, 72212
Int. Cl.[3] F23D 15/00
U.S. Cl. 165—96 3 Claims



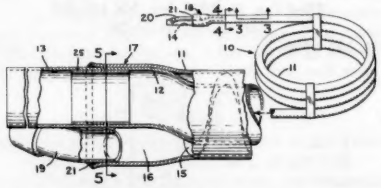
1. A gas-controlled heat-pipe thermostat of high precision comprising a closed pipe interiorly covered with a capillary structure, said pipe defining first and second condensation zones and an intermediate evaporation zone; a gas pressure regulation system containing control gas in communication with said second condensation zone and a working fluid within said pipe which upon reaching said evaporation zone is vaporizable and dividable into two portions, each portion flowable to one of said first and second condensation zones after which it returns to said evaporation zone by way of said capillary structure for recycling, said control gas of said gas pressure regulation system forming a buffer zone, and said positioning of said evaporation zone in relation to said second condensation zone resulting in the evaporation condensation cycle through the first of said condensation zones being separated from the control gas by the evaporation condensation cycle through said second condensation zone.

4,286,653

COAXIAL TUBE IN TUBE HEAT EXCHANGER WITH INNER TUBE SUPPORT

Ray C. Edwards, Kinnelon, N.J., assignor to Edwards Engineering Corporation, Pompton Plains, N.J.

Filed Jul. 21, 1980, Ser. No. 170,547
Int. Cl.[3] F28D 7/14
U.S. Cl. 165—156 6 Claims



1. In a coaxial tube in tube heat exchanger;

a. an outer tube

b. an inner tube coaxial with the outer tube to form an annular fluid flow passage between the inner tube and the outer tube,

c. at least one terminal connector disposed for communication with said fluid flow passage,

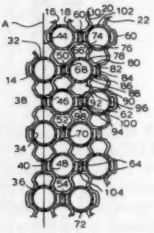
d. at least one fluid tight connection for holding the outer tube, the inner tube and the terminal connector in assembled position,

e. at least one support unit in the inner tube operatively aligned with each of the fluid tight connections.

4,286,654
HEAT EXCHANGER TUBE SUPPORTS

Anthony Ruhe, Fonthill, and James H. D. Nickerson, St. Catharines, both of Canada, assignors to Foster Wheeler Limited, Ontario, Canada

Filed Jun. 8, 1979, Ser. No. 46,988
Claims priority, application Canada, Mar. 19, 1979, 323743
Int. Cl.³ F28F 9/00
U.S. Cl. 165—172 **4 Claims**



1. In a heat exchanger a number of heat exchange tubes having a tube support comprising:

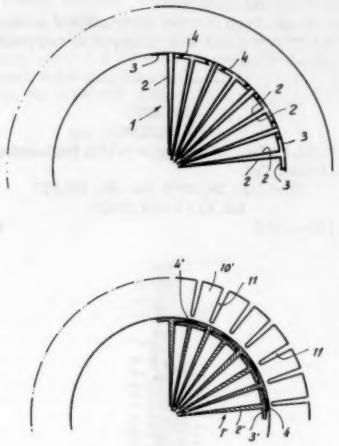
a plurality of strips, each of said strips having a plurality of equidistant first contact locations in one plane, a plurality of first portions extending in a given direction away from said plane from an adjacent first contact location to one of a plurality of second contact locations, a plurality of second portions, each extending in another direction from an adjacent second contact location and toward said one plane to one of a plurality of third contact locations, a plurality of third portions, each extending in said direction from an adjacent third contact location to one of a plurality of fourth contact locations; a plurality of fourth portions, each extending from an adjacent fourth contact location in said other direction and toward said plane to one of a plurality of fifth contact locations, a plurality of fifth portions each extending from one of said fifth contact locations in said direction and away from said plane to one of a plurality of sixth contact locations, a plurality of sixth portions each extending away from an adjacent sixth contact location in said other direction to another of said first locations, said fourth contact locations lying equidistant along another plane and joined to the first locations of an adjacent strip; the second contact location engaging over the width of the surface of said strip the surface of a tube extending through said other plane; the third and fifth contact locations engaging over the width of the surface of said strip a tube extending through said one plane and the sixth contact location engaging over the width of the surface of said strip the surface of another tube extending through the other plane.

4,286,655
FINNED TUBE FOR HEAT EXCHANGERS

Benito L. Trojani, Via Polar, 8, Lugano, Breganzona, Switzerland

Filed Aug. 14, 1979, Ser. No. 66,434
Claims priority, application Italy, May 21, 1979, 22856 A/79
Int. Cl.³ F28F 1/42; B21D 53/00
U.S. Cl. 165—179 **8 Claims**

1. A finned tube provided with both external and internal fins, particularly suitable to be used as a heat exchanger, constituted by a plurality of longitudinally extended, circumferentially arranged sections, the base portion of each section being curved according to a circle arc, alternate sections overlapping the adjacent sections thereby forming the outer wall of an extended tube having alternate inner and outer sections in overlapping arrangement, each of said sections having an internal fin which extends both longitudinally and radially inwardly within said tube and terminates in the proximity of the tube circumference center, the internal fin from each of said sections forming with adjacent fins a plurality of small

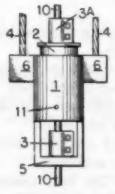


channels for the longitudinal flow without stagnation of fluid through the length of said tube, and a helically arranged, edge wrapped fin disposed on the outer wall of said tube.

4,286,656
COMPOSITE CARRIER BAR DEVICE

Donald W. Felder, 1153A Drennan Park, Fort Campbell, Ky. 42223

Filed Feb. 12, 1979, Ser. No. 11,691
Int. Cl.³ E21B 17/02
U.S. Cl. 166—75 R **4 Claims**



1. In an oil well pumping unit utilizing a sucker rod, including a polish rod, for operating a bottom hole pump, a composite carrier bar device comprising:

(a) a main body having top and bottom portions and a central ram cavity therein opening through said top portion for receiving a hydraulic ram in upright position,

(b) support means on said main body for supporting said main body in the pumping unit,

(c) a secondary carrier bar fixed to and spaced centrally below said main body a predetermined distance,

(d) said main body and said secondary carrier bar having vertically aligned holes therethrough for slidably receiving the polish rod of the pumping unit,

(e) an upper clamp member above said main body adapted to be releasably clamped to the polish rod in various vertically adjusted fixed positions,

(f) said upper clamp member being adapted to rest upon the top of a hydraulic ram received in said ram cavity while said upper clamp member is clamped to said polish rod in fixed position,

(g) a lower clamp member having a height less than said predetermined distance and positioned within the space

between said secondary carrier bar and said main body, said lower clamp member being adapted to be releasably clamped to the polish rod in various vertically adjusted positions in said space, and

(h) said lower clamp member being adapted to rest on said secondary carrier bar while clamped to said polish rod in an operative position.

4,286,657

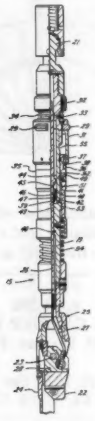
ACTUATOR

Gary A. Kohn, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 26, 1979, Ser. No. 106,917

Int. Cl.³ E21B *23/03*

U.S. Cl. 166—117.5 **9 Claims**



1. A tool comprising,

a body,

an actuator in telescoping relationship with and reciprocable relative to the body,

a dog carrying sleeve in telescoping relationship with and reciprocable relative to the body,

a first closed fluid chamber provided by spaced seals between the actuator and body,

a second closed fluid chamber provided by spaced seals between the sleeve and body,

a flowway between the two chambers transferring fluid between the two chambers with relative reciprocation of the body and sleeve, and

hydraulic fluid filling the two chambers, all of said seals exposed to the exterior of the tool on their sides opposite the pressure chamber,

reciprocation of said sleeve relative to said body resulting in reciprocation of said actuator in response to transfer of fluid between the two chambers.

4,286,658

ISOLATION PACKER AND METHODS OF CEMENTING FROM A FLOATING VESSEL

Eugene E. Baker, and Ernest E. Carter, Jr., both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Nov. 8, 1978, Ser. No. 958,706

Int. Cl.³ E21B *23/00*

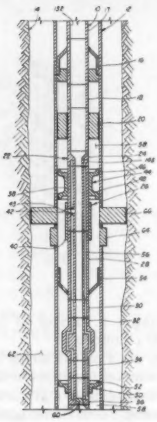
U.S. Cl. 166—186 **4 Claims**

1. An isolation packer, comprising:

a tubular body including an upper tubular body assembly, a middle body connected to said upper tubular body assembly, and a lower tubular body assembly, connected to said middle body;

an upper inner mandrel, having an upper and a lower end communicating with an axial bore of said upper tubular body assembly and an axial bore of said middle body, respectively;

a lower inner mandrel, having an upper and a lower end communicating with said axial bore of said middle body and an axial bore of said lower tubular body assembly, respectively;



port means, disposed through one of said mandrels, said port means communicating an inner cavity of said one mandrel with a radially outer surface of said tubular body; and

upper and lower packer assemblies connected to said tubular body above and below said port means.

4,286,659

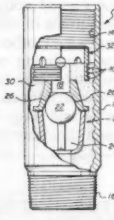
BALL VALVE SAFETY SCREEN

Benson H. Bolding, Jr., St. Martinville, La., assignor to Aztec Tools, Inc., Lafayette, La.

Filed Aug. 28, 1979, Ser. No. 70,430

Int. Cl.³ E21B *43/08*

U.S. Cl. 166—205 **4 Claims**



1. A float collar for use in well preparation and production of hydrocarbons comprising:

(a) a longitudinal body having a longitudinal passageway therethrough;

(b) a valve assembly positioned in said body, including a float valve positioned in said passageway;

(c) and screen means mounted above said valve assembly and over said passageway for enabling circulation of fluids such as drilling mud, casing cement and the like through said passageway, said screen means preventing unwanted objects from clogging, stopping or otherwise preventing flow of fluid through said float collar assembly, screen means including a flat circular perforated screen portion positioned substantially perpendicular to said body and

extending to cover substantially the entire interior of said body and a cylindrical mounting ring attached to and depending downwardly from the edge of said screen portion, said mounting ring including means for rigidly mounting said mounting ring within said body and said mounting ring including a plurality of perforations therein for permitting the flow of fluid therethrough.

4,286,660

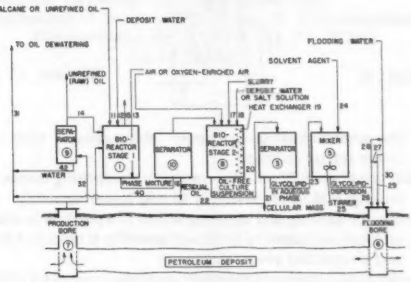
PROCESS AND INSTALLATION FOR THE FLOODING OF PETROLEUM DEPOSITS AND OIL SHALE

Fritz Wagner, Braunschweig-Stöckheim; Peter Rapp; Hans Bock, both of Brunswick; Walter Lindörfer, Kassel; Walther Schulz, Vechta, and Wilhelm Gebetsberger, Barnstorf, all of Fed. Rep. of Germany, assignors to Gesellschaft für Biotechnologische Forschung GmbH and Wintershall Aktiengesellschaft, both of, Fed. Rep. of Germany

Filed Mar. 23, 1979, Ser. No. 23,295

Int. Cl.[3] E21B *43/22*; C12M *1/02*

U.S. Cl. 166—246 **17 Claims**



1. Process for the flooding of petroleum deposits and oil shale by means of dispersions of non-ionogenic, boundary surface active materials in water as flooding medium, through the utilization of a suitable bioreactor with or without mechanical stirring for a first stage for the production of a growing submerged culture of hydrocarbon enriched microorganisms in a semi- or continuous process under aerobic conditions, under the addition of organic C- sources, inorganic nutrients dissolved in water and occasionally growth materials as well as the addition of air or oxygen-enriched air at a predetermined reaction temperature and constant pH value in the region of between 2 and 9, with a second stage in which the formed effective material is separated from the cell material and, with utilization of the aqueous separating phase with the therein dispersed effective material directly as flooding medium or as addition to the flooding water, characterized in that in the first stage there are produced as the effective material glycolipids with the hydrocarbon enriched microorganism under the utilization of a hydrocarbon mixture of 1 to 35% by volume at a reaction temperature in the range of 20° to 50° C. and at a constant pH value in the range of between 3 and 9, and that thereafter in the second stage the formed glycolipids are separated from the cell material in the form of an aqueous phase through a temperature, pH, or osmotic shock or through extraction and a petroleum deposit and oil shale flooding amount of the aqueous phase with the therein dispersed glycolipids are directly used as a flooding medium or added to the flooding water.

4,286,661

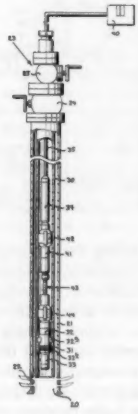
EQUALIZING VALVE FOR USE IN A WELL TOOL STRING

Imre I. Gazda, Saginaw, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 40,035, May 17, 1979, abandoned, which is a division of Ser. No. 437, Jan. 2, 1979, abandoned, which is a division of Ser. No. 864,878, Dec. 27, 1977, Pat. No. 4,149,593. This application Jun. 16, 1980, Ser. No. 159,811

Int. Cl.[3] E21B *23/00, 47/06*

U.S. Cl. 166—316 **13 Claims**



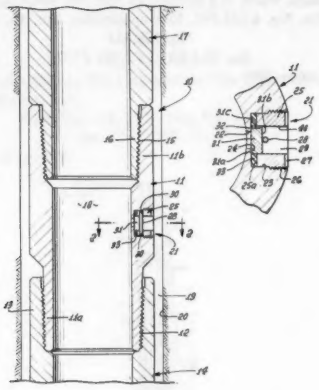
1. An equalizing valve for use in a tool string in a well bore comprising: an outer tubular housing having a head end provided with fluid flow passages for communicating with a well tool connected with said housing; a longitudinally movable valve-mandrel member supported in said housing having a longitudinal bore open at an end opposite to said head end of said housing and having radially opening ports communicating with the other end of said bore through said valve-mandrel member, said valve-mandrel member being movable from a first closed position to a second open position; spaced seal means between said housing and said valve-mandrel member positioned on opposite sides of said radially opening ports in said member when said member is at said first closed position; said housing being provided with a side port communicating with said radial ports of said valve-mandrel member when said member is at said second open position; said housing having flow passage means communicating with said passage means in said head end of said housing for fluid communication from said bore to said valve-mandrel member and said head end passages when said valve member is at said first position; and spring means engaged between said housing and said valve-mandrel member biasing said housing and said valve-mandrel in opposite longitudinal directions; and said valve-mandrel member and said housing being connected to move in telescopic relationship whereby oppositely directioned forces applied to said housing and to said valve-mandrel member move said valve-mandrel member between said first closed position and said second open position.

4,286,662

TUBING DRAIN

John S. Page, Jr., 21372 Brookhurst St. No. 312, Huntington Beach, Calif. 92646

Filed Nov. 5, 1979, Ser. No. 91,207
Int. Cl.³ E21B *43/11*
U.S. Cl. 166—317 **6 Claims**



1. In an oil well tubing drain assembly,

(a) a tubing wall containing a bore intersecting the tubing interior and a counterbore intersecting the tubing exterior,

(b) an annular retainer in the counterbore having connection to said wall, the retainer forming a side drain passage,

(c) a retaining member carried by the retainer and projecting into said drain passage, said retaining member comprising a pin extending across said drain passage and received in drilled passages in the retainer,

(d) a closure in alignment with said drain passage and retained by said member with a surface of the closure located at the side of said member closest to the tubing bore interior, the closure closing off said tubing wall bore, the closure adapted to be blown out said drain passage when fluid pressure in the tubing bore transmits sufficient force via said closure to rupture said member, said closure comprising a disc-shaped piston having a diameter approximately the same as the diameter of said drain passage,

(e) and a sealing washer located in said counterbore and extending about said closure to have sealing engagement therewith in response to pressure exerted on the washer by the fluid in said tubing, said washer being elastomeric and located in engagement with the end of said retainer closest to the tubing bore interior.

4,286,663

HYDRAULIC PUMPING ROD CONNECTING AND DISCONNECTING DEVICE

Hubert Miffre, Elancourt, France, assignor to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Jul. 23, 1979, Ser. No. 59,339
Claims priority, application France, Jul. 27, 1978, 78 22202
Int. Cl.³ E21B *41/00*
U.S. Cl. 166—325 **6 Claims**

1. A pump rod connecting device for connecting an upper column of pump rods to a lower column of pump rods, and for disconnecting the upper pump rod column from the lower column comprising:

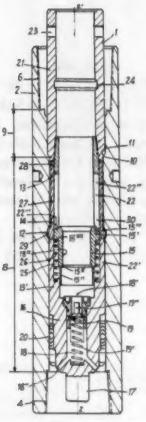
a tubular production tubing connecting piece connected between upper and lower columns of production tubing, said connecting piece comprising a circular upwardly directed seat and an internal annular circular groove;

a connector comprising an upper assembly and a lower assembly;

means for securing said upper assembly to a lower end of the upper column of pump rods;

means for securing said lower assembly to an upper end of the lower column of pump rods;

said lower assembly of said connector means for positioning the lower assembly in said connecting piece, comprising locking means for locking said lower assembly in said connecting piece, and means for blocking said locking means, said lower assembly further having passage means



for communicating said upper tubing column with said lower tubing column;

said upper assembly of said connector comprising means for locking said upper assembly to said lower assembly;

means for moving said blocking means to a position in which said locking means of the lower assembly is unlocked from said connecting piece, and

hydraulically operated remotely controlled means for releasing said locking means for connecting said upper assembly to said lower assembly so that the upper column of pump rods and said upper assembly secured thereto can be removed from the lower assembly.

4,286,664

POSITIVE SEAL FLOAT COLLAR

Benson H. Bolding, Jr., St. Martinville, La., assignor to Aztec Tools, Inc., Lafayette, La.

Filed Aug. 28, 1979, Ser. No. 70,348
Int. Cl.³ E21B *34/08*; F16K *15/04*
U.S. Cl. 166—325 **2 Claims**

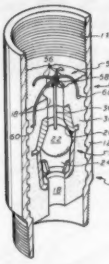
1. A float collar for use in well preparation and production of hydrocarbons, comprising:

(a) a longitudinal body mounted between tubular casing joints, said body having a longitudinal passageway therethrough for enabling communication of said joints;

(b) a valve assembly positioned within said body having a ball valving element in an upper conical valve seat positioned in said passage; and

(c) a resilient strap supported above said valve assembly

permanently connected to said ball valving element for urging said ball valving element in positive sealing engagement against said conical valve seat to preclude fluid flow in an upward direction.

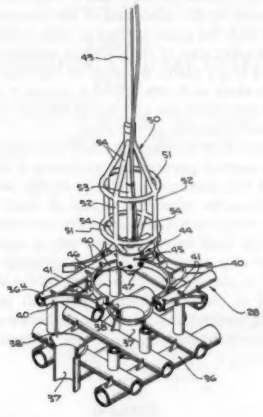


4,286,665

APPARATUS AND METHOD FOR CONDUCTING OFFSHORE WELL OPERATIONS

Raymond W. Walker, Huntington Beach, Calif., assignor to Deep Oil Technology, Inc., Long Beach, Calif.

Continuation of Ser. No. 899,112, Apr. 24, 1979, abandoned.
This application Oct. 17, 1979, Ser. No. 85,340
Int. Cl.³ E21B 7/12
U.S. Cl. 166—339 **20 Claims**



1. In combination:

a sea floor template frame means for one or more wells each having a well axis including

a latch ring member provided with an annular engagement face on said template means arranged coaxial to each well axis;

a retrievable guide line base frame adapted to be lowered in coaxial relation with a selected well axis and freely movable around said selected well axis relative to said ring member for random positioning in any angular relation to said ring member;

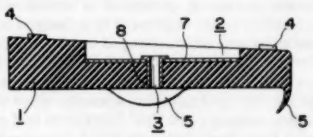
and latch means on said guide line base frame cooperably engageable with said annular engagement face on said latch ring member on said template frame means in any random angular position of said guide line base frame about said well axis relative to said ring member.

4,286,666

HORSESHOES

Kisaku Nakanishi, Tokyo, Japan, assignor to Shin Gijutsu Kigyo Kabushiki Kaisha, Yokohama, Japan

Filed Oct. 22, 1979, Ser. No. 87,000
Claims priority, application Japan, Oct. 27, 1978, 53-147097
Int. Cl.³ A01L 5/00
U.S. Cl. 168—4 **13 Claims**



1. An elastomeric horseshoe comprising:

an elastomeric body portion having a lower surface adapted to face the ground and an upper surface adapted to be fixed in use against the bottom surface of a hoof of a horse;

an elongated recessed area defined by said elastomeric body portion and extending upwardly from said lower surface into the interior of said body portion, said recessed area being of a width and height appropriate to receive the head of at least one relatively short and thin errection nail;

a nail bore area extending from said recessed area to said elastomeric body portion upper surface; and

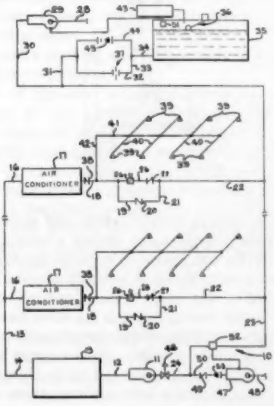
non-elastomeric reinforcing means disposed at the bottom of said recessed area for securely holding in place a nail extending from said recessed area through said nail bore area and into said hoof.

4,286,667

FLOW CONTROL AND FIRE DETECTION APPARATUS

Donald G. Westenhofer, Brookfield, Conn., and Gershon Meckler, Bethesda, Md., assignors to Gershon Meckler Associates, P.C., Washington, D.C.

Filed Feb. 27, 1979, Ser. No. 15,619
Int. Cl.³ A62C 35/00
U.S. Cl. 169—16 **1 Claim**



1. Apparatus comprising a system for circulating an aqueous heat transfer fluid from an equipment station, into heat transfer relationship with at least one heat transfer unit and through a conduit which returns the fluid back to the equipment station, a plurality of sprinkler heads, and means operatively connecting the sprinkler heads to receive heat transfer fluid from the circulating system, the improvement wherein the connecting

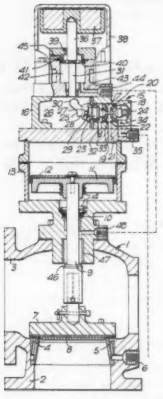
means for the sprinkler heads is connected to the circulating system between a heat transfer unit and the return conduit with no heat transfer unit between said connection and the return conduit, means providing parallel flow paths between said connection and the return conduit, a first check valve in one of said parallel flow paths, said check valve being effective to prevent fluid flow from the return conduit toward said connection, a flow sensor and a second check valve in the other of said parallel flow paths, said second check valve being effective to prevent flow from said connection toward the return conduit, makeup means operatively connected to introduce water into the return conduit, means responsive to a changed condition in the circulating system which changed condition indicates that fluid id flowing from the system and effective in response to the changed condition to activate said makeup means to introduce water into the return conduit whereby, when the apparatus is operating normally, the fluid flows from said connection through said first check valve to the return conduit while, when the apparatus is in a fire mode, fluid flows from the return conduit through said second check valve and said flow sensor to said connection, and then from the system, and a signal from the flow sensor can be used to indicate the location of the fluid flow from the system.

4,286,668

SPRINKLER SYSTEM CONTROL VALVE AND ACTUATOR DEVICE

Derek McCormick, 73 Station St., Misterton, Doncaster, South Yorkshire, England

Filed Mar. 29, 1979, Ser. No. 25,075
Int. Cl.³ A62C *37/06*
U.S. Cl. 169—22 **6 Claims**



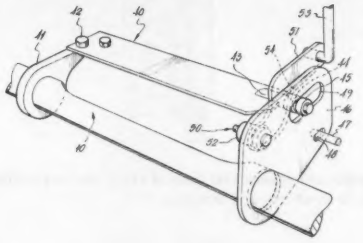
1. A sprinkler system control valve and actuator device comprising a water supply valve having a housing provided with a water inlet for connection to sprinkler heads and a valve seat with which a movable valve member cooperates, a valve actuator attached to the valve housing and operable by the pressure in the water inlet to maintain the valve member sealed against the valve seat cutting off the water inlet from the water outlet, and a trip valve operable when tripped to vent the water pressure from the actuator so as to allow the valve member to lift from the valve seat, and trip means operatively connected to the trip valve to trip the latter in response to a pneumatic signal, said trip means maintaining the trip valve in its tripped condition until manually reset, said valve actuator comprising a piston movable within and sealed relative to a cylinder, the piston having an effective surface area greater than the effective area of the valve member subjected to the water pressure when the valve member is sealed against its valve seat, thereby maintaining the water supply valve closed.

4,286,669

DRAFT SENSING APPARATUS

Jean J. Lasoen, Ville Preux, France, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed May 24, 1979, Ser. No. 41,976
Claims priority, application United Kingdom, May 30, 1978, 24606/78
Int. Cl.³ A01B *63/112*
U.S. Cl. 172—7 **13 Claims**



1. A tractor draft sensing apparatus including an elongated shaft having spaced apart support portions for mounting in spaced apart fulcrum supports and end portions positioned axially outward of said support portions to receive a pair of draft members for imposing rearwardly extending draft forces on the shaft as a result of which the shaft bends, an elongate member attached at one end to the shaft and arranged to extend generally parallel thereto, a pivotally mounted cam member, a cam follower carried by the other end of the elongate member for pivoting of the cam member, a guidance member provided with a guide surface, and a separate guide surface follower carried by the other end of the elongate member for engagement with the guide surface to limit relative movement between said other end of the elongate member and the shaft generally to a single plane, whereby on the imposition of draft forces on the shaft said cam follower moves generally in said single plane and pivots the cam by an amount proportional to the draft forces imposed on the shaft.

13. A tractor draft sensing apparatus including an elongated shaft having support portions for mounting in spaced fulcrum supports and end portions positioned axially outward of said support portions for mounting a pair of draft members, the arrangement being such that rearwardly extending draft forces imposed on the shaft by the draft members cause the shaft to bend, and sensing means arranged to produce a draft signal proportional to the amount of bending of the shaft, the shaft being shaped so that, considering the shaft in an unloaded condition, the neutral axis of the shaft between the support portions is displaced rearwardly of the centerline of the support portions.

4,286,670

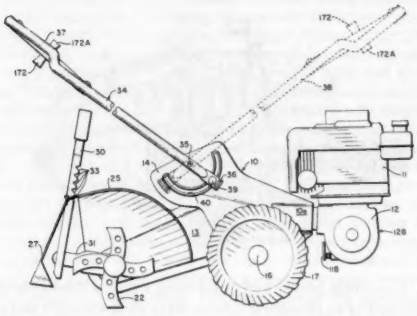
COMBINATION TILLER AND CULTIVATOR AND DRIVE CONTROL THEREFOR

Donald W. Ackerman, East Greenbush, N.Y., assignor to Garden Way Incorporated, Charlotte, Vt.

Filed Dec. 7, 1978, Ser. No. 967,411
Int. Cl.³ A01B *33/02*; B62D *51/04*
U.S. Cl. 172—42 **8 Claims**

8. A combination tiller and cultivator machine comprising an engine and rotatable tines mounted on opposite ends of a frame, a pair of drive wheels on opposite sides of the frame, a reversible transmission mounted on the frame for drivingly connecting the engine to the wheels and the tines for rotating the wheels and the tines in selected angular directions, a handle bar with means pivotally supporting the same on the frame for movement about a horizontal transverse axis between a first position overlying one end of the frame and a second position overlying the opposite end of the frame, and a transmission

drive selector including control means mounted on the handle bar and connected to the transmission, the control means being biased into a normally neutral position, disengaging the transmission, and manually movable from neutral to opposite forward and reverse operating positions for respectively actuating the transmission into forward and reverse power modes, first detent means on the handle bar for maintaining the control



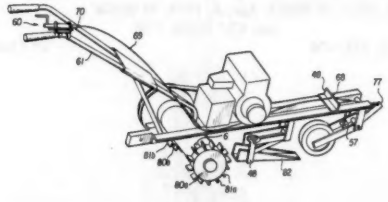
means in said neutral position, the control means being manually movable away from the operator into forward position in both the first and second positions of the handle bar, and second detent means cooperating with the control means for temporarily maintaining the control means in said forward position in both first and second positions of the handle bar in a forward transmission power mode.

4,286,671

KIT FOR CONVERTING A ROTARY TILLER INTO A PLOW

James A. Mays, Birmingham, Ala.

Filed May 10, 1979, Ser. No. 37,884
Int. Cl.³ A01B *3/58*; B62D *51/04*
U.S. Cl. 172—253 **8 Claims**



1. A rotary tiller plow attachment for converting into a plow a rotary tiller of the type having a frame, at least one handle bar means extending rearwardly therefrom, and a power driven axle for turning a set of tines, comprising:

(a) a pair of pull wheels detachably mountable onto said power driven axle;

(b) a plow attachment assembly detachably mountable onto the front portion of said frame of said rotary tiller, and

(c) a height adjusting means for continuously adjusting the height of said plow attachment assembly while said power driven axle turns said pair of pull wheels, including:

(i) a height adjustment control mountable onto one of said handle bar means of said rotary tiller, and

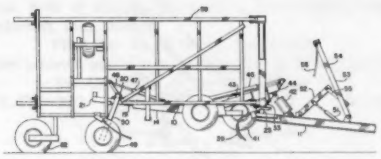
(ii) a detachably connectable control cable for connecting said height adjustment control to said plow attachment assembly.

4,286,672

REARWARDLY FOLDING AGRICULTURAL IMPLEMENT WITH EXTENDABLE TRANSPORT WHEELS

Clark H. Forsyth, Burlington; Anton H. G. Van Hooydonk, St. Catharines, and Harold D. Ralph, Hamilton, all of Canada, assignors to International Harvester Company, Chicago, Ill.

Filed Apr. 18, 1980, Ser. No. 141,449
Int. Cl.³ A01B *73/00*
U.S. Cl. 172—311 **9 Claims**



1. In a pull-type ground working implement of the type having a center frame, a pair of wing frames that are adapted to carry ground working tools, with each said wing frame being pivotally connected to an end of said center frame for movement between an operating position wherein said frames are transversely aligned, to a generally vertical position, and then to a transport position in which the wing frames are pivoted rearwardly, wherein the improvement comprises:

a subframe that is adapted to carry ground working tools, said subframe supporting said center frame and having a front end adapted to be connected to a tractor, the other end of said subframe extending rearwardly of said center frame;

a set of operating wheels swingably mounted on said subframe for selective movement to an extended ground engaging position to support the implement in the operating position and to a retracted position for transport;

an operating wheel swingably mounted on each said wing frame for selective movement to a ground engaging position to support the wing frame thereof in the operating position;

a combination operating and transport wheel mounted on each said wing frame to support the wing frame thereof in the operating position and in movement to, and in the transport position;

latch means for latching said wing frames to said subframe in the transport position;

and a set of transport wheels mounted on said subframe rearward of said subframe operating wheels, said subframe transport wheels being swingably mounted for movement from a retracted position during operating, to an extended position for transport, said subframe transport wheels being located generally adjacent said combination wheels in the transport position and providing with said combination wheels the only ground support for said implement in the transport position, thereby resulting in desirable handling characteristics.

4,286,673

BASKET-SHAPED DUAL-FUNCTION HOE-RAKE

Rudolf J. A. M. van Rooijen, Breda, Netherlands, assignor to Bertha-Maria van Rooijen-Nieuwenhijs, Breda, Netherlands

Filed Jun. 21, 1979, Ser. No. 50,692
Claims priority, application Netherlands, Jun. 26, 1978, 7806870
Int. Cl.³ A01B *1/14*
U.S. Cl. 172—378 **4 Claims**

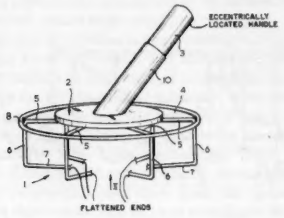
1. A dual-function hoe-rake, which comprises:

a wide-mesh basket-shaped structure having a central axis;

a handle; and

means for operatively connecting said handle and said basket-shaped structure, said wide-mesh basket-shaped struc-

ture having improvement in combination therewith comprising a plurality of first wires which extend directly radially outwardly from said central axis of said structure, a plurality of second wires which are connected substantially at right angles to said first wires belonging therewith and which extend in an axial direction away from said handle, and a plurality of third wires which are connected substantially at right angles to said second wires belonging



therewith and extend in the form of prongs projecting directly radially inwardly only part of the way toward said central axis, said third wires having flattened ends located radially of said central axis, said first and third wires being respectively located in axially spaced planes which are substantially parallel to one another, said second wires extending substantially perpendicular to said axially spaced planes.

4,286,674

REPLACEABLE BEARING ASSEMBLY FOR CONSTRUCTION VEHICLES

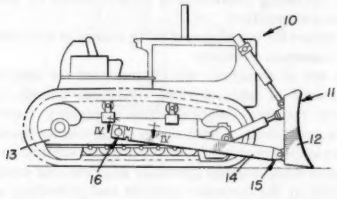
Charles M. Noble, Shorewood, and James A. Olthoff, South Holland, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US79/00763, § 371 Date Sep. 24, 1979, § 102(e) Date Sep. 24, 1979, PCT Pub. No. WO81/00897, PCT Pub. Date Apr. 2, 1981.

This PCT application filed Sep. 24, 1979, Ser. No. 93,077

Int. Cl.[3] **E02F** *3/76;* **F16C** *25/04*

U.S. Cl. 172—811 **11 Claims**



1. A vehicle having a first member (**14**), a second member (**19**), and bearing means (**16**) for pivotally mounting said first member (**14**) on said second member (**19**) and for counteracting thrust loads imposed on said first member (**14**), said bearing means (**16**) including separable first (**17**) and second (**17'**) bearing caps each being separable from each other and from said push arm, fastening means (**28**) for releasably securing said first bearing cap (**17**) to said first member (**14**) and for further releasably securing said first (**17**) and second (**17'**) bearing caps together, and

upper and lower slots (**22**) defined transversely completely through said first member (**14**) and wherein said fastening means (**28**) includes at least two bolts (**26**) extending sequentially through said second bearing cap (**17'**), said first bearing cap (**17**), and said first member (**14**) and into said slots (**22**).

4,286,675

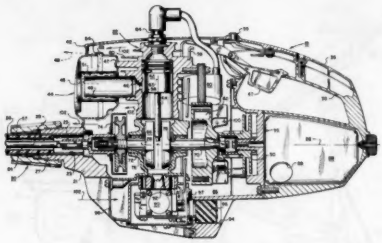
NARROW PROFILE POWER HANDLE FOR LINE TRIMMER AND THE LIKE

Lloyd H. Tuggle, Shreveport, La., assignor to Beaird-Poulan Division of Emerson Electric Co., Shreveport, La.

Filed Jun. 25, 1979, Ser. No. 51,950

Int. Cl.[3] **E21B** *7/22, 3/00*

U.S. Cl. 173—163 **39 Claims**



1. A portable power tool comprising a rotary head coupled to one end of an elongated tubular drive shaft assembly and an internal combustion engine coupled to the opposite end of the drive shaft assembly, an elongated housing enclosing the internal combustion engine, the housing including a rear handle having a hand grip portion disposed above and projecting rearwardly along the top of the housing, a muffler communicating with the exhaust port from the internal combustion engine and disposed along the forward face of the housing for discharging products of combustion forwardly of the housing, and a forward handle attached to the tubular drive shaft assembly having a hand grip portion disposed substantially above the discharge path of the products of combustion.

4,286,676

CRANK CONNECTOR FOR DIRECTIONAL DRILLING

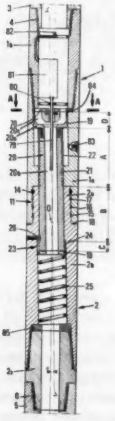
Jean-Paul Nguyen, Rueil Malmaison; Emmanuel Laval, Paris, and Andre Cendre, Cosne sur Loire, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jul. 24, 1979, Ser. No. 60,110

Claims priority, application France, Jul. 24, 1978, 78 22063; Apr. 6, 1979, 79 08803; Apr. 6, 1979, 79 08804

Int. Cl.[3] **E21B** *7/08*

U.S. Cl. 175—74 **17 Claims**



1. A crank connector adapted for having its angle varied by

remote control comprising: a first tubular member adapted for being secured at the lower end of a drill string and having a longitudinal axis, a second tubular member adapted for being connected to a downhole motor for rotating a drill bit and having a longitudinal axis, a rotary fitting having an axis of rotation, said second tubular member being rotatable, with respect to its longitudinal axis, about said axis of rotation of said rotary fitting, said axis of rotation and said longitudinal axes of said first and second tubular members being separated from each other and converging substantially at the same point to define respective acute angles, said rotary fitting comprising a connecting shaft connecting said first and second tubular members together and being slidable therein with said shaft being fixedly rotatably secured to one of said first and second tubular members and movable into a lock position with respect to the other of said first and second tubular members for being rotatably secured thereto, said shaft being axially displaceable with respect to said other of said first and second tubular members for being disengaged therefrom, angle remote control means for varying it will the angular position of said second tubular member with respect to said first tubular member by pivoting said second tubular member, with respect to its longitudinal axis, about said axis of rotation, maintenance means for maintaining said tubular members in a selected angular position with respect to each other, remotely controlled displacing means for axially displacing said connecting shaft, and driving means for transforming an axial displacement of said connecting shaft from its locking position into a rotation of said second tubular member about said axis of rotation.

4,286,677

HELICAL IMPACT BIT FOR DRILLING STONE WITH NARROW GUIDE LIPS

Raymond Guex, Nyon, Switzerland, assignor to Guex and Fils S.A., Nyon, Switzerland

Filed Sep. 27, 1979, Ser. No. 79,541

Claims priority, application Switzerland, Sep. 28, 1978, 10115/78

Int. Cl.³ E21B *10/44*

U.S. Cl. 175—395 **5 Claims**

1. A bit for drilling stone for use in a hammer drill or an electric hammer, comprising a tip having a diameter with a value within the range of 5 to 12 mm, a plate of hard metal provided at the tip of the bit, a cylindrical body defining two helical recesses for the evacuation of waste material produced during drilling, said helical recesses defining an angle of less than 35° to the longitudinal axis of the bit, the body in axial section defining said recesses such that all of the latter have like profiles at least approximately in the form of an arc of a circle with a radius having a value within the range of 8 mm to 15 mm according to the diameter of said cylindrical body, a core defined by said recesses and two guide lips forming a part of said cylindrical body and located between said two recesses, said guide lips defining a surface area which forms a part of the outer cylindrical surface defined by said body, the ratio of the cylindrical surface area of said lips to the total cylindrical surface of said cylindrical body being less than 5%, and the ratio between the minimum diameter of said core and the diameter of said outer cylindrical surface having a value within the range of 0.6 to 0.65.

4,286,678

CARRYING TOWER FOR A METALLURGICAL VESSEL

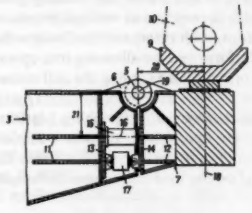
Werner Scheurecker, Linz, and Ernst Drab, Kirchdorf an der Krems, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Sep. 10, 1979, Ser. No. 73,865

Claims priority, application Austria, Oct. 4, 1978, 7143/78

Int. Cl.³ G01G *19/52;* **B22D** *39/04*

U.S. Cl. 177—132 **10 Claims**



1. In a carrying tower for a metallurgical vessel for use in a continuous casting plant, including a carrying column, at least one carrying arm projecting from said carrying column for accommodating said metallurgical vessel, weighing means being provided in said at least one carrying arm and said at least one carrying arm being dividedly designed so as to form carrying arm parts, said carrying arm parts being articulately connected with each other about a horizontal axis, the improvement which is characterized in that

said carrying arm parts have supporting faces for support with respect to each other,

said supporting faces are arranged at a distance from the axis connecting said carrying arm parts, and

force measuring means are inserted between said supporting faces.

4,286,679

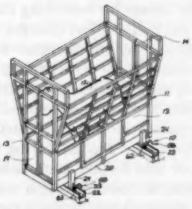
ANIMAL SCALE

H. Allen Schneider, Mead, Wash., assignor to Weigh Right Electronic Systems, Inc., Spokane, Wash.

Filed Sep. 13, 1979, Ser. No. 74,977

Int. Cl.³ G01G *19/52, 23/02, 21/24*

U.S. Cl. 177—132 **6 Claims**



1. An animal weighing scale, comprising:

a support frame;

an elongated weighing platform having a planar surface adapted to receive the animal and adapted to permit the

animal to move over the platform from one end to another;

first horizontal rigid elongated tie bars having opposed ends connecting the support frame and platform about pivot axes parallel to the planar platform surface and transverse to the length thereof to allow slight vertical deflection of the platform and to resist horizontal motion thereof in a longitudinal direction;

second horizontal rigid elongated tie bars having opposed ends connecting the frame and platform about pivot axes parallel to the planar platform surface and oriented longitudinally with respect to the elongated platform to allow slight vertical deflection of the platform and to resist horizontal motion thereof in a transverse direction;

tensile load cell means for generating an analog signal proportional to the magnitude of tensile force applied thereto;

platform suspension means suspending the platform from the frame and mounting the tensile load cell means intermediate the platform and frame, for directly placing the load cell in tension in response to vertical downward deflection of the platform with respect to the frame when the animal is on the platform and for allowing free upward deflection of the platform without loading the cell means in compression; and

isolator means between the weighing platform and frame and selectively operable to transfer complete support of the platform directly to the support frame thereby relieving any load on the load cell means and suspension means.

4,286,680

WEIGHING APPARATUS

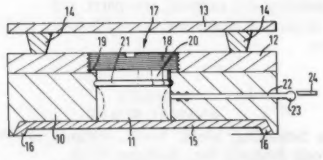
Thomas F. Maltby, The Red House, Selbourne, Hampshire; Robert C. Maltby, Doscombe Cottage, Hawkley, Hampshire, and Alan W. Wakefield, 13 N. Stroud La., Petersfield, Hampshire, all of England

Filed Apr. 17, 1980, Ser. No. 141,159

Claims priority, application United Kingdom, Apr. 25, 1979, 14474/79

Int. Cl.³ G01G *5/04, 21/00*

U.S. Cl. 177—208 **6 Claims**



1. A weighing apparatus comprising a resilient body formed of an elastomeric material, a cavity provided in said body, a fluid contained in said cavity, conduit means connecting the cavity to indicator means for indicating changes in volume of the cavity when the body suffers changes due to compression forces applied thereto by the member being weighed, said body having a resilient metal plate bonded to an upper surface thereof, a resilient metal load support plate mounted on said first mentioned plate and a further resilient metal plate bonded to the body and spaced below the first mentioned plate and to which reaction forces are applied during weighing, said first mentioned plate or said further plate being provided with a screw-threaded bore in communication with the cavity, and a screw-threaded closure plug in scew-threaded engagement with the screw-threaded bore, said closure plug having an inner end portion which engages with part of the wall of the cavity to prevent that part of the wall being deformed when the body suffers changes due to compression forces applied thereto by the member being weighed.

4,286,681

BOTTOM PLATES FOR WALKING MECHANISMS, CONNECTED BY MEANS OF CONNECTION PIECES

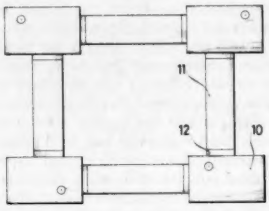
Bernhard Kirchhoff, Ennigerloh, Fed. Rep. of Germany, assignor to O & K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Apr. 16, 1979, Ser. No. 30,593

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1978, 2817046

Int. Cl.³ B62D *57/02*

U.S. Cl. 180—8 R **14 Claims**



1. Bottom plate system for walking mechanisms for the movement of heavy loads, comprising

connection pieces,

bottom plates adapted to contact uneven terrain,

means for elastically connecting said connection pieces with said bottom plates, respectively, such that said bottom plates are elastically connected to each other forming a closed loop structure,

said connection pieces being formed as profile shaped members having an open side in cross-section so as to be torsionally elastic.

4,286,682

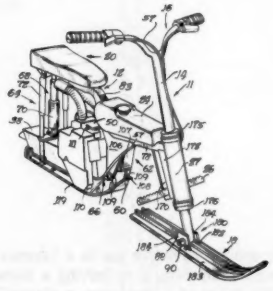
MOTORIZED SKI BOB

Charles Stewart, Bourbonnais, and Richard W. Condon, Frankfort, both of Ill., assignors to Roper Corporation, Kankakee, Ill.

Filed Oct. 4, 1978, Ser. No. 948,583

Int. Cl.³ B62M *27/02*

U.S. Cl. 180—9.24 A **12 Claims**



1. A ski bob driven by a motor and having a frame supported by a front steerable ski and a rear power driven ski and a seat attached to the frame, which seat provides an operator's position, said rear ski having running surfaces which support a substantial portion of the weight of the operator and which slide on the snow and having a continuous driving track, a forward attachment means for pivotally mounting said power ski to said frame at a location longitudinally forward of the operator's position and adjacent a front end of the seat, said continuous driving track extending from adjacent the front end

of said seat to a rearward end rearwardly of the rearward end of said seat;

a rearward attachment means for attaching said power ski to said frame at a location longitudinally rearward of the operator's position;

said running surfaces extending from a location rearward of seat forwardly to adjacent the front end of said seat;

the lower surface of said running surfaces defining a plane which is higher relative to the ground at the forward portion of the running surfaces than at the rearward portion of said receiving surfaces; and

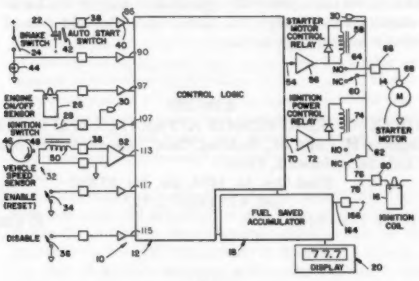
biasing means for biasing the rear portion of said power ski downwardly and the operator's weight being located substantially over the rear power driven ski to urge said running surfaces and said driving track of said power driven ski into engagement with the snow when traversing a snow covered terrain.

4,286,683

STOP/START CONTROL SYSTEM FOR ENGINE

Willard L. Zeigner, San Ramon, and Peter G. Blaney, Walnut Creek, both of Calif., assignors to Zemco, Inc., San Ramon, Calif.

Filed Aug. 20, 1979, Ser. No. 68,098
Int. Cl.³ B60K *15/00*
U.S. Cl. 180—54 R **4 Claims**



1. For use with a vehicle having an internal combustion engine with a drive shaft, a starter motor, an ignition system with an ignition switch and a battery, a brake means and an accelerator means, a system for automatically controlling the shutdown and restarting of the engine in order to conserve fuel at times when the vehicle would be otherwise stopped with the engine running at idle speed, said system comprising:

an enable switch connected to said battery for turning said system "on";

first control means for producing a first series of input signals when the engine is running and the vehicle is stopped;

a first logic means responsive to said input signals from said first control means to provide an output;

means responsive to the output from said first logic means for disabling the ignition system to thereby stop the engine;

second control means, including a manually operated auto start switch for producing a second series of input signal when the engine is off with the vehicle stopped;

a second logic means responsive to said second control means to provide an output for controlling restarting of the engine;

means responsive to the output of said second logic means for activating the starter motor to start the engine;

means responsive to said output from said first logic means for computing the amount of fuel saved during an engine shutdown period between an automatic engine stop and an engine restart by the system;

means for providing an engine idle fuel flow rate reference;

clock means connected to said reference means and operable at a rate proportional thereto;

counter means driven by said clock means for producing an output proportional to the accumulated fuel saved;

gate means connected between said clock means and said counter means and responsive to the output from said first logic means for controlling said counter means; and

display means for providing a visual representation of the accumulated fuel saved from said counter means.

3. An automatic stop and restart control system for a vehicle provided with an internal combustion engine having an ignition circuit, a battery power supply and a starter motor, comprising:

first control means for automatically causing an engine shutdown when the vehicle is stopped with the engine at idle speed;

second control means for restarting the engine following a period of time after an automatic engine shutdown;

accumulating means for computing the amount of fuel being saved during the engine shutdown time period; and

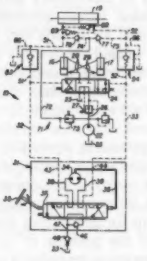
means for displaying the computed amount of fuel saved after the engine has been restarted.

4,286,684

HYDRAULIC SERVO STEERING SYSTEM

Lawrance F. Berg, Lockport, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00228, § 371 Date, Mar. 3, 1980, § 102(e) Date, Mar. 3, 1980.
This PCT application filed Mar. 3, 1980, Ser. No. 189,958
Int. Cl.³ B62D *5/08*
U.S. Cl. 180—133 **4 Claims**



1. In a hydraulic steering system (**10**) having a pilot operated steering valve (**24**), a hand metering unit (**31**) in fluid communication with opposite ends of the steering valve (**24**), a followup servo cylinder (**19**), a pair of lines (**51,52**) connecting opposite ends of the servo cylinder (**19**) to opposite ends of the steering valve (**24**), the improvement comprising:

a pair of pilot operated valves (**53,54**) individually positioned within the pair of lines (**51,52**) each being movable between a closed position at which fluid flow therethrough is blocked and an open position at which fluid can communicate between the servo cylinder (**19**) and the opposite ends of the steering valve (**24**), each of the pilot operated valves (**53,54**) being moved to the open position in response to fluid pressure in the pair of lines (**51,52**) reaching a preselected level and to the closed position in response to the fluid pressure in the lines (**51,52**) between the pilot operated valves (**53,54**) and the opposite ends of the servo cylinder being (**19**) less than the preselected level, and

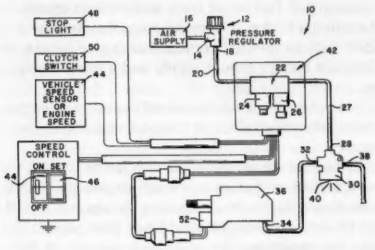
means (**71**) for establishing fluid pressure in the pair of lines (**51,52**) above the preselected level, said means (**71**) being connected to the lines (**51,52**) at a location between the pilot operated valves (**53,54**) and the servo cylinder (**19**).

4,286,685

SPEED CONTROL FOR HEAVY DUTY TRUCKS

Pamela Rudolph, Elyria; Robert D. Krieder, Wellington, and Patrick J. O'Keefe, Jr., Elyria, all of Ohio, assignors to The Bendix Corporation, Southfield, Mich.

Filed May 23, 1979, Ser. No. 41,573
Int. Cl.[3] B60K *31/00*
U.S. Cl. 180—176 **14 Claims**



3. In a vehicle having a source of compressed air, a speed control system comprising speed sensing means for generating a speed signal proportional to a vehicle speed parameter, control means for controlling said speed parameter, said control means including memory means for generating a memory signal representing a value of said speed parameter, means for generating a difference signal proportional to the difference between said memory signal and the speed signal, and means for generating an error signal as a function of the difference signal, a throttle control mechanism responsive to compressed air from said source for controlling the position of the vehicle engine throttle, a pair of electrically actuated valves, one of said electrically actuated valves controlling communication between said compressed air source and said throttle control mechanism, the other of said electrically actuated valves controlling communication between said throttle control mechanism and ambient atmosphere, and duty cycle generating means responsive to said error signal for cyclically actuating said electrically actuated valves for varying percentages of the time of each cycle dependent upon the value of said error signal, said throttle control mechanism including a housing, a piston slidable in said housing and connected to the vehicle engine throttle, means for communicating compressed air into said housing, and means for generating a position signal which varies as a function of the position of said piston, said error signal generating means being responsive to said position signal for varying said error signal as a function of the value of said position signal.

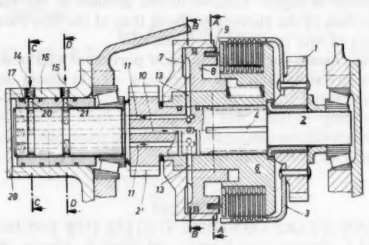
4,286,686

MULTI-PLATE FRICTION CLUTCH

Rudolf Franke, Martinstrasse 31, D-6100 Darmstadt, Fed. Rep. of Germany

Filed Feb. 5, 1979, Ser. No. 9,717
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1978, 2805692; May 11, 1978, 2820582
Int. Cl.[3] B60K *23/08;* **F16D** *25/00*
U.S. Cl. 180—233 **15 Claims**

1. A multi-plate friction clutch for motor vehicles operable by fluid pressure and having an inner plate carrier and an outer plate carrier, wherein the inner plate carrier has a hub swivel-mounted on a shaft between two positions through a control angle α to form a rotary slide valve such that in one position a pressure cylinder for applying pressure to the clutch plates is in communication with a source of fluid pressure through a feed line, and in the other position the pressure cylinder is in communication with a fluid discharge line and is cut off from the feed line, wherein the shaft has at least one radial bore connectable to the feed line and at least one other radial bore connectable to the discharge line, and wherein the inner plate carrier has at least two radial bores leading to the pressure cylinder, the bores in either the shaft or the inner plate carrier being spaced apart by 90° and the bores in the inner plate carrier or the shaft being correspondingly spaced apart by $90°\pm\alpha$, a sleeve on the shaft rotatable with respect to a stationary housing of the clutch through a second control angle β, the sleeve forming a second rotary slide valve such that, in one direction of rotation in the shaft the feed line communicates through the



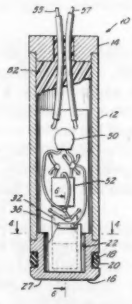
sleeve with a duct in the shaft leading to said one of the radial bores and the discharge line communicates through the sleeve with another duct in the shaft leading to said one other of the radial bores, and in the other direction of rotation by the shaft the feed lines communicate through the sleeve with said one other of the radial bores through its duct and the discharge line communicates through the sleeve with the said one of the radial bores through its duct.

4,286,687

AIR GUN FIRING SENSOR APPARATUS AND SYSTEM

Augustus H. Fiske, Jr., Redding, Conn., assignor to Bolt Associates, Inc., Norwalk, Conn.

Filed Oct. 24, 1979, Ser. No. 87,659
Int. Cl.[3] G01V *1/137*
U.S. Cl. 181—120 **15 Claims**



1. A pressure-sensitive transducer assembly for determining the instant of firing of an air gun by sensing pressure changes occurring in the air gun when it is fired comprising:

a casing,

a head wall included in one end of said casing,

recess means positioned in said head wall adapted to communicate with a passage leading into said air gun,

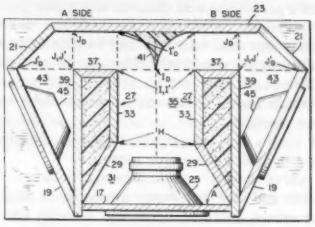
a pressure-sensitive transducer mounted in said head wall adjacent to said recess means,

said pressure-sensitive transducer having its neutral axis extending parallel to said recess means,

whereby pressure variations in said recess means are transmitted through said head wall traverse to the neutral axis of said pressure-sensitive transducer for producing an

electrical signal indicative of the instant of firing of the air gun.

4,286,688
LOUDSPEAKER APPARATUS
Arthur L. O'Malley, 26 Grove St., Oneonta, N.Y. 13820
Continuation of Ser. No. 904,147, May 9, 1978, abandoned. This application Nov. 30, 1979, Ser. No. 99,188
Int. Cl.³ H05K *5/00*
U.S. Cl. 181—156 **12 Claims**



1. Loudspeaker apparatus comprising:

(A) an enclosure having parallel top and bottom panels, between which are perpendicularly disposed parallel front and back panels, as well as an opposed pair of identical major side panels which extend rearwardly from the front of said enclosure at equal first obtuse interior angles with respect to said front panel and an opposed pair of identical minor side panels which extend forwardly from the rear of said enclosure at equal second obtuse interior angles with respect to said back panel, said minor side panels respectively having edge-to-edge junctions with said major side panels;

(B) an electrically drivable loudspeaker within said enclosure and centrally mounted on said front panel to project forwardly traveling sound energy directly out of said enclosure when said loudspeaker is electrically driven;

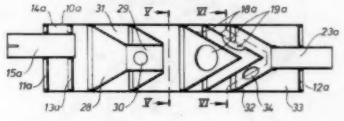
(C) a pair of passive radiators within said enclosure, each being centrally mounted on a respective one of said major side panels to project sound energy directly out of said enclosure when driven by received sound energy; and

(D) means within said enclosure for dividing backwardly traveling sound energy from said loudspeaker into two substantially equal portions and channeling each portion in uniform driving relation to a respective one of said passive radiators, said dividing and channeling means including:

(a) an elongated deflection member extending perpendicularly between said top and bottom panels, said deflection member having, coextensive with its length, a mounting surface disposed against the back panel and two concave arcuate deflection surfaces converging from the back panel toward one another about a vertical plane of symmetry of said enclosure and intersecting to define a linear apex spaced from said loudspeaker and normal to the speaker axis; and

(b) a pair of prismatic divider members extending perpendicularly between said top and bottom panels, each divider member being spaced from said deflection member and spaced from and disposed between said loudspeaker and a respective one of said passive radiators, whereby said backwardly traveling sound energy from said loudspeaker is initially channeled between said divider members to said convergent concave arcuate deflection surfaces of said elongated deflection member and divided thereby into said two substantially equal portions, whereafter each said portion is channeled between a respective one of said prismatic divider members and, successively, said back panel, a respective one of said minor side panels and a respective one of said major side panels.

4,286,689
EXHAUST GAS MUFFLER
Sven O. Malmsten, Raberga, S710 15 Vintrosa, Sweden
Filed Aug. 6, 1979, Ser. No. 63,677
Claims priority, application Sweden, Aug. 15, 1978, 7808659; Jun. 20, 1979, 7905427
Int. Cl.³ F01N *7/02, 1/08*
U.S. Cl. 181—232 **4 Claims**



1. An exhaust gas muffler comprising a tubular envelope, a gas inlet at one end of said envelope, a gas outlet at the other end of said envelope, said ends of the tubular envelope being closed except for said gas inlet and outlet, at least one muffler insert between said ends including at least two spaced cones, the peripheral edge of each of said cones engaging the inner wall of said tubular envelopes at space locations, the axes of symmetry of said spaced apart cones being substantially coaxial to the central axis of said envelope, the apex of the front cone, as seen in the direction of flow, is inserted in the end cone, the latter being frustro-conical and co-axial with the other cone and directed in the same way, the narrowing part of said end cone opening into said gas outlet, and said end cone having at least one port opening into a front chamber defined by said end cone, said tubular envelope and the end wall of said envelope, a single relatively large gas flow passage in each of said cones, each of said gas flow passages having centers which are angularly separated from the centers of gas flow passages in adjacent cones, each of said inserts being disposed in said tubular envelope with the apices of the cones directed toward said outlet, said cones of each of said insert being so arranged with respect to spacing from one another such that the apex of the rearmost cone, as viewed in the direction of the gas flow, lies downstream of a plane perpendicular to the direction of the axis through the surface of abutment to the envelope of said front cone.

4,286,690
ESCAPE DEVICE
Roland E. Gastine, Bedford, Tex., assignor to Commercial Management Corporation, Fort Worth, Tex.
Filed Mar. 5, 1979, Ser. No. 17,285
Int. Cl.³ A62B *1/06*
U.S. Cl. 182—5 **14 Claims**

1. An escape device for allowing a user to descend from a damaged structure, comprising in combination:

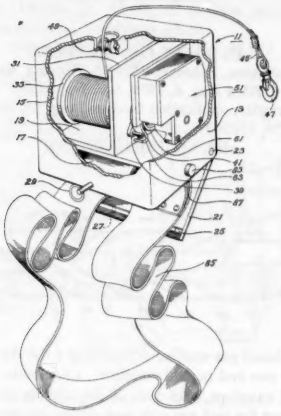
a housing having a drum compartment and a strap compartment separated from each other by a partition, the strap compartment having a door releasably mounted to the housing;

a drum rotatably mounted to the housing inside the drum compartment;

a cable wound around the drum and extending through an opening in the top of the drum compartment, the cable having an end adapted to be secured to a part of the structure;

a strap having its ends secured to the housing to form a loop for the user to place about his body for descending with the housing, the strap being foldable inside the strap compartment; and

shock absorber means connected between the drum and the retarding means for absorbing shock due to jerking of the



cable to reduce the shock being transmitted to the retarding means.

4,286,691

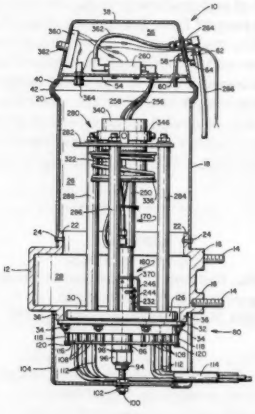
TRUCK LUBRICATOR

Jack V. Stong, Swanton, Ohio, assignor to Seco Manufacturing, Inc., Toledo, Ohio

Filed Jul. 11, 1979, Ser. No. 56,511

Int. Cl.[3] F16N *7/14, 13/22*

U.S. Cl. 184—7 CR **17 Claims**



1. In apparatus for periodically dispensing lubricant through a plurality of conduits extending to selected sites within a mechanism, said apparatus being of a variety having a housing mountable in the vicinity of said mechanism, said housing including a reservoir for retaining a quantity of said lubricant and distributor means mounted upon said housing and having input means for receiving said lubricant and including selector means actuable to incrementally rotate about a centrally disposed axis between positions effecting a passageway communicating said input means with predetermined ones of said conduits, the improvement comprising:

a pump assembly fixedly mounted upon said housing substantially coaxially with said centrally disposed axis and including:

cylinder means defining a pump chamber having an inlet port communicating with said reservoir;

inlet check valve means for selectively opening and closing said inlet port;

a pump piston actuable to slide reciprocally within said pump chamber and having a metering edge movable therewith between first and second positions along a path spaced a predetermined distance from said inlet port and defining a receiving chamber within said pump chamber when said metering edge is at said first position;

meter valve means mounted upon said cylinder means, positioned a predetermined distance along said path from said first position, communicating between said receiving chamber and said reservoir and having open and closed orientations for selectively effecting the removal of lubricant from said receiving chamber to said reservoir when said pump piston is moved from said first toward said second position;

control means for selectively effecting the opening and closing of said meter valve means;

output valve means communicating between said pump chamber and said distributor means input means; and

actuator means mounted upon said housing for selectively actuating said selector means to effect said rotation thereof and for actuating said pump piston to move from said second to said first position to load said receiving chamber with a charge of said lubricant through said inlet port and, subsequently, to move from said first to said second position to effect the expression of said lubricant selectively through said meter valve means when in an open orientation and, subsequently, through said output valve means.

4,286,692

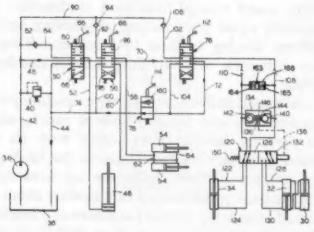
HYDRAULIC CONTROL SYSTEM FOR OPERATING MULTIPLE REMOTE DEVICES WITH A MINIMUM NUMBER OF CONNECTING CONDUITS

James J. Bauer, Richland, and Willard L. Chichester, Battle Creek, both of Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Sep. 22, 1978, Ser. No. 944,829

Int. Cl.[3] B66B *9/20*

U.S. Cl. 187—9 R **14 Claims**



1. In a hydraulic system, first and second hydraulic motor means, selector valve means movable to first and second positions in response to first and second respective control pressures present in the low pressure side of the system for operatively connecting said valve means in said first position to said first hydraulic motor means and in said second position to said second hydraulic motor means, operator valve means adapted to select the operation of said first or second motor means and to establish said first or second control pressure, and shuttle valve means continuously responsive to the high pressure side of the system for continuously communicating the low pressure side thereof to said selector valve means when the system is in operation.

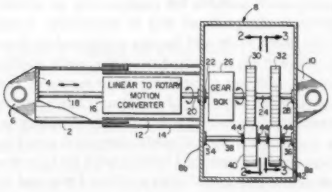
9. In a hydraulic system, first and second hydraulic motor means, selector valve means movable to first and second positions in response to first and second respective control pressures present in the low pressure side of the system for operatively connecting said valve means in said first position to said first hydraulic motor means and in said second position to said second hydraulic motor means, a directional control valve controlling the direction of operation of the first and second motor means and a control pressure selector valve for selection by the operator of the first and second control pressures, said selector valve means and first and second motor being supported from a carriage movable vertically on an upright of a lift truck, or the like, and two hydraulic conduits reeved on the upright connecting the directional control valve to the selector valve means, a shuttle valve connected between said hydraulic conduits and responsive to the pressure in the conduit carrying the highest pressure fluid for communicating to said selector valve means the lower pressure fluid in the other conduit in which is established said first or second control pressure by said control pressure selector valve.

4,286,693

MECHANICAL SNUBBER

Harry E. Sulzer, Telford, Pa., assignor to Anchor/Darling Industries, Inc., Bala Cynwyd, Pa.

Filed Feb. 9, 1979, Ser. No. 10,621
Int. Cl.[3] F16D 63/00
U.S. Cl. 188—378 **16 Claims**



1. A mechanical force responsive snubber to damp the effects of seismic or other shock and vibration comprising:

a first snubber terminal for securing said snubber to a first external structure;

a second snubber terminal for securing said snubber to a second external structure, said external structures being subject to relative movement, one with respect to the other;

bi-directional toothed escapement means actuated into one of two directions of movement in response to relative movement of said first and second snubber terminals with respect to each other; and

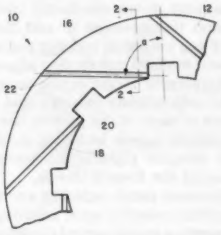
weighted engagement means having an axis, and having a predetermined effective mass, of the eccentric type, said engagement means being engaged with said escapement means for oscillatory rotation about said axis and being responsive to movement of said escapement means in either of the two directions for effecting the oscillatory rotation of said engagement means to have the weighted engagement means limit the movement of the escapement means equally in either of the two directions to limit the velocity and acceleration between said snubber terminals.

4,286,694

GROOVED CARBON BRAKE DISCS

Roy R. Wiseman, Jr., and James J. Kovac, both of Akron, Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Continuation of Ser. No. 639,391, Dec. 10, 1975, abandoned, which is a continuation of Ser. No. 223,949, Feb. 7, 1972, abandoned. This application May 16, 1979, Ser. No. 39,489
Int. Cl.[3] F16D 55/36
U.S. Cl. 188—71.5 **6 Claims**



1. A disc brake having a stack of alternate rotating and stationary annular discs having torque transfer notches therein extending across the full width of the disc carried between a backing plate and a pressure plate, said discs operating in the earth's atmosphere, comprising:

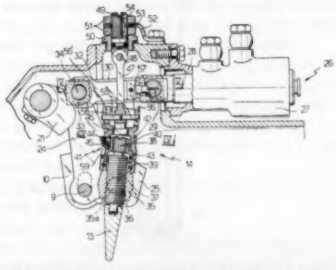
each annular disc being of substantially uniform thickness across their full width and formed of a carbon based material capable of absorbing water and having a plurality of grooves extending across at least one of the rubbing faces of the disc, each groove extending the full distance between the inner and outer peripheries of the disc to transfer water-based steam and vaporized gasses emanating from the disc material from between adjacent discs caused by heating during a braking action, the grooves being located at spaced intervals around the disc, each groove in at least alternating discs extending at a large angle from a radius thereof.

4,286,695

DEVICE FOR AUTOMATICALLY ADJUSTING BRAKE CLEARANCE, IN PARTICULAR FOR AN EARTH MOVING MACHINE

Giorgio Grattapaglia, Turin, Italy, assignor to Fiat-Allis Macchine Movimento Terra S.p.A., Lecce, Italy

Filed Sep. 24, 1979, Ser. No. 78,574
Claims priority, application Italy, Oct. 6, 1978, 69320 A/78
Int. Cl.[3] F16D 65/56
U.S. Cl. 188—196 BA **13 Claims**



1. A device for automatically adjusting the clearance between braking components of a brake mechanism including actuation means displaceable to effect frictional contact between braking components moveable from a clearance position

relative to each other to a contacting position in a braking mechanism, and wherein

said actuation means includes a moveable member displaceable in a first direction to move the braking components from the clearance position to the contacting position and in a second direction from said contacting position to the clearance position, the device comprising

linkage means coupling displacement of said moveablemember to said movement of said brake components, p1 said linkage means including a first adjustment means and a second adjustment means selectively coupled to permit relative motion therebetween in said first direction of movement of said moveable member and selectively coupled to transmit motion from the first adjustment means to the second adjustment means in said second direction of movement to automatically maintain said clearance position regardless of wear of the braking components,

said first adjustment means including a tubular member mounted for selective rotation and having at least one helically oriented slot formed therein,

said second adjustment means including a rotatably mounted threaded member rotatable upon selective movement of said tubular member in said second direction of movement and having at least one rigidly retained pin operatively coupled in said helically oriented slot of said tubular member, and

clutch means operably connected to said first and second adjustment means permitting said relative motion in said first direction of movement of the moveable member and transmitting said motion in said second direction,

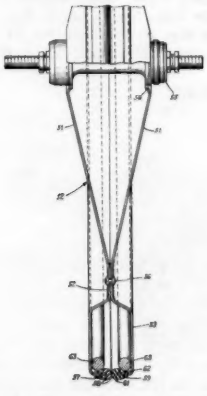
said clutch means including a gear member having a plurality of gear teeth and a plurality of actuating rods circumferentially mounted about the periphery of said gear member to sequentially engage said gear teeth for transmitting motion from said first adjustment means to said second adjustment means when moved in said second direction of motion.

4,286,696

BRAKE FLYWHEEL FOR BICYCLE-TYPE ERGOMETRIC EXERCISER

Eugene J. Szymski, Skokie, and Rene Mraz, Evanston, both of Ill., assignors to Excelsior Fitness Equipment Co., Northbrook, Ill.

Filed Jan. 14, 1980, Ser. No. 111,483
Int. Cl.[3] F16D *65/12*
U.S. Cl. 188—218 A **4 Claims**



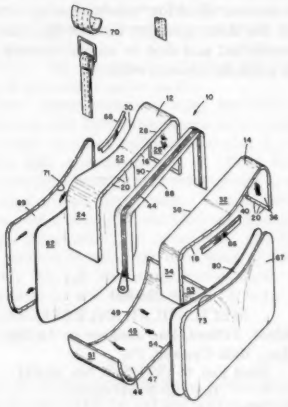
1. A brake flywheel for a bicycle-type ergometric exerciser, comprising two stamped metal discs dished to provide intermediate contacting ring portions and outer spaced-apart marginal portions, means for securing said intermediate portions together, opposed inwardly directed peripheral flanges on said marginal portions, an extruded rubber strip having a flange-receiving slot mounted on each said flange, and a steel ring disposed within the peripheral portion of each said disc for rotation therewith for inertially weighting said flywheel, said rubber strips providing inner peripheral seats for said steel rings to prevent rattling thereof during flywheel movements.

4,286,697

BODY-ATTACHABLE BAG FOR CARRYING CAMERAS OR THE LIKE

Robert A. Baker, Dandridge, Tenn., assignor to Engineered Products, Inc., Dandridge, Tenn.

Filed Jan. 2, 1980, Ser. No. 109,158
Int. Cl.[3] A45C *3/10, 13/00, 13/30*
U.S. Cl. 190—48 **1 Claim**



1. A bag particularly suitable for transporting an article in a suspended position alongside of and in substantial wrapping contact with the user's body and having a reduced tendency to swing relative to such user's body during the user's walking or other movements, said bag comprising strap means of suitable length to overwrap the shoulder of a user and having its opposite ends extending downwardly from such shoulder in the direction of a user's waist, first flexible elongated panel means formed into a generally inverted U-shape with its base portion defining a substantial portion of the top of said bag and its leg portions defining substantial portions of the opposite ends of said bag, said ends of said strap being secured to respective ones of said leg portions, second elongated panel means of substantially the same length as and substantially coterminal with said first panel means but of more narrow width disposed in side-by-side relation to said first panel means with one of the side edges of said first panel means being contiguous to one of the side edges of said second panel means, said contiguous side edges being aligned along the aforesaid U-shape to define a top opening in said bag, closure means extending along said contiguous side edges and adapted to releasably join said side edges to one another, third elongated flexible panel means formed into a generally U-shape with its base portion defining the bottom of said bag and its leg portions extending upwardly to respective positions on the opposite ends of said bag, each of said leg portions of said third panel means terminating adjacent the coterminal ends of said first and second panel means, means joining each of said ends of said third panel means to said respective coterminal ends of said first and second panel means, first side panel means, means joining said first side panel means along its perimeter to the outboard side edges of said first and third panel means to close one side of said bag, second side panel means, means joining said second side panel means along its perimeter to the side edges of said second and third

panel means to close the opposite side of said bag, said first panel means having one side edge which is outboard and concave with respect to the length dimension of said first panel along that portion thereof which is disposed on the top of said bag, said third panel means having one side edge which is outboard and concave with respect to the length dimension of said third panel in that portion thereof which is disposed on the bottom of said bag whereby said second side panel, when joined to said side edges as aforesaid, is caused to assume a concave geometry, and flexible crease resistant panel means, having greater regidity than said concave side panel, secured in contact with said concave side panel.

4,286,698

SLIDING CONTACT FOR A TOY VEHICLE

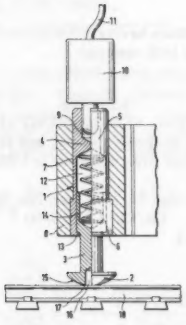
Artur Fischer, Weinhalde 34, 7244 Waldachtal 3/Tumlingen, Fed. Rep. of Germany

Filed Nov. 9, 1979, Ser. No. 93,617

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1978, 7837353[U]

Int. Cl.³ B60L *5/38*

U.S. Cl. 191—49 **5 Claims**



1. A sliding contact for a toy vehicle, particularly for current transmission from a current-conductive rail of a toy railroad to an electric motor of the toy vehicle, the sliding contact comprising a body part which has an axis and a side arranged to face toward the current-conductive rail, said body part having a central portion located adjacent to said axis and provided with a depression which is open at said side, and a peripheral portion which surrounds said central portion has a convex face at said side, said convex face of said peripheral portion and said depression of said central portion intersecting one another to form an edge at the location of intersection, so that when said body part slides on the current-conductive rail, an unobstructed gap is formed between said convex face of said peripheral portion of said body part and the current-conductive rail, which gap is immediately followed by said edge linearly contacting the current-conductive rail, whereby said edge not only provides for contact with the current-conductive rail, but also removes extraneous particles from the latter.

4,286,699

DUAL FUNCTION HANDGRIP CONTROL

Gustav J. Pawelka, Box 612, Sedona, Ariz. 86336

Filed Jan. 7, 1980, Ser. No. 109,783

Int. Cl.³ B60K *41/20*

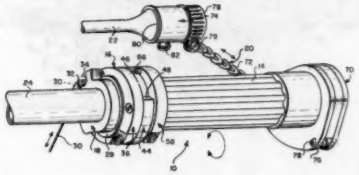
U.S. Cl. 192—1 **7 Claims**

1. A dual control handgrip device for individually operating a first and a second device, comprising:

a handgrip, including a gripping portion:

first control means for operating an associated device in response to rotary mechanical forces;

mounting means operable to rotatably mount said handgrip on said first control means; said mounting means comprising a first portion secured to said first control means and operable to rotably drive said first control means, and a second portion mounted on said handgrip; said first and second portions being rotatable with respect to each other; and a lost motion connection connecting said first and second portions for concurrent rotation to rotably drive said first control means when said first and second portions are moved in a first predetermined direction, and permitting relative movement therebetween when said



first and second portions are rotated in a second predetermined direction, opposite said first predetermined direction; and

second control means secured to said handgrip and operable to control a second device in response to the relative rotation of said first and second portions in said second predetermined direction;

whereby said first and second control means are individually operated.

4,286,700

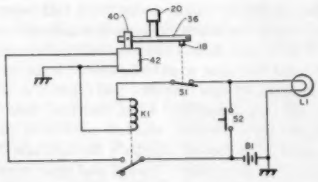
MOTORCYCLE THROTTLE CONTROL

James E. Morris, 18814 Cedar Valley Way, and Bobby J. Myers, 26330 Ridgevale Dr., both of Newhall, Calif. 91321

Filed Nov. 1, 1979, Ser. No. 90,192

Int. Cl.³ B60K *41/20*

U.S. Cl. 192—1 **9 Claims**



1. A motorcycle throttle control apparatus in which a motorcycle has handlebars and a rotatable throttle handle grip;

a locking arm secured to said grip for rotation thereof;

a toothed cog rigidly secured to said handlebars;

means biasing said locking arm into engagement with said cog whereby said grip may be locked at an open position;

release means for releasing said locking arm from engagement with said cog;

latch means for latching said locking arm out of engagement with said cog;

actuating means for actuating said locking arm by disengaging said latch means;

said release means comprising:

a release lever in said housing adapted to engage one end of said pivoted locking arm; and

operating means for operating said release lever whereby said operating means causes said locking arm to be released from said cog and engaged by said latch means;

whereby said grip may rotate to a closed position.

4,286,701

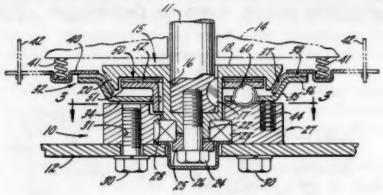
AMPLIFYING CLUTCH

J. G. Fraser MacDonald, Detroit, Mich., assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Continuation-in-part of Ser. No. 946,441, Sep. 27, 1978, abandoned. This application Dec. 26, 1979, Ser. No. 107,038

Int. Cl.[3] **F16D** *13/02, 15/00, 67/02*

U.S. Cl. 192—18 R **10 Claims**



1. A clutch comprising rotatably mounted input and output members, a rotatably mounted first shoe supported to move axially relative to said input member and to turn angularly through a limited distance relative to said output member, coacting friction surfaces on said input member and said first shoe, said friction surfaces engaging one another and causing said first shoe to turn with said input member when said first shoe is moved axially toward said input member, said friction surfaces effectively releasing one another and enabling said input member to turn relative to said first shoe when said first shoe is moved axially away from said input member, selectively operable means for causing said first shoe to move axially toward and away from said input member, a rotatably mounted second shoe supported to move axially relative to said input and output members and coupled to rotate substantially in unison with said output member, coacting friction surfaces on said input member and said second shoe, said latter friction surfaces engaging one another and causing said second shoe to be turned by said input member when said second shoe is moved axially toward said input member, said latter friction surfaces effectively releasing one another and enabling said input member to turn relative to said second shoe when said second shoe is moved axially away from said input member, said clutch being characterized by means located between and engageable with said second shoe and said output member and coupled to said first shoe so as to be moved angularly through a limited distance by said first shoe and relative to said second shoe and said output member when said first shoe is initially turned by said input member, said last-mentioned means being effective upon being moved angularly through said distance to force said second shoe axially toward said input member without producing an axial reaction force against said first shoe.

4,286,702

FEED PIPE FOR CONVEYING STICKY BULK MATERIAL

Peter Langen, Hanrathstrasse 43, 5303 Bornheim-Walberg, Fed. Rep. of Germany

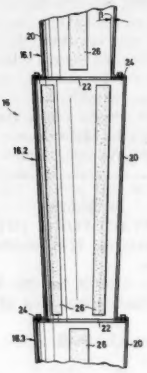
Filed Nov. 20, 1978, Ser. No. 962,007

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1978, 2827602

Int. Cl.[3] **B65G** *11/02*

U.S. Cl. 193—2 R **3 Claims**

1. A vertically mounted feed pipe for gravity feeding from a bunker outlet into a conveying apparatus bulk material having a tendency to arch, said feed pipe consisting of a plurality of serially connected downwardly tapering tubular members of substantially identical design having a ratio of their axial length to their average diameter which is smaller than that required for arching of the bulk material to occur and at least one of said tubular members having about its inner circumference first and



second surface portions having different coefficients of friction with respect to the bulk material.

4,286,703

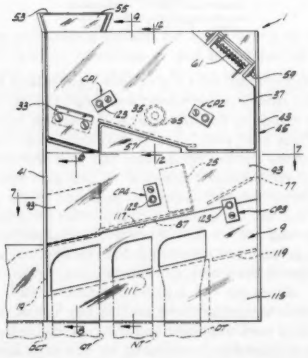
COIN TESTING AND SORTING APPARATUS

James T. Schuller, St. Louis County, and Harry C. Haeusser, High Ridge, both of Mo., assignors to UMC Industries, Inc., Stamford, Conn.

Filed May 11, 1979, Ser. No. 38,088

Int. Cl.[3] **G07F** *3/00*

U.S. Cl. 194—100 A **25 Claims**



25. Coin apparatus for use in a vendor for handling acceptable coins and rejecting unacceptable items inserted in the coin slot of the vendor and for making change, comprising:

a plurality of change tubes, one for each of a plurality of denominations of acceptable coins that may be inserted in the coin slot of the vendor, each of said tubes being adapted to hold a stack of coins of a respective denomination, and being open at the top for being filled with coins from the top;

a plurality of sensors, one for each change tube, for sensing the filling of each tube with coins of the respective denomination to a predetermined level in the tube;

coin sorting means for sorting coins of said denominations and delivering to each change tube coins of the denomination for that tube, said sorting means having an entrance for coins of the different denominations to be sorted, exits for drop-out of coins of the different denominations into

the respective tubes, and a sorting gate for one of said exits,

passage means for travel of acceptable coins and unacceptable items inserted in the coin slot of the vendor toward the coin sorter entrance, means along said passage means for detecting whether an item travelling therein is an acceptable coin or an unacceptable item and, if it is an acceptable coin, determining its denomination; and

means controlled by said detecting means for effecting delivery of coins of each of said denominations inserted in the coin slot of the vendor to the coin sorting means in response to the sensor for the change tube for coins of that denomination detecting the level of coins therein as below the respective predetermined level, for effecting opening of said sorting gate if the coin delivered to the coin sorting means is a coin of said one denomination for drop-out of the coin into the respective change tube, for effecting delivery of a coin inserted in the coin slot of the vendor to an accept system in response to the sensor for the change tube for coins of that denomination detecting the level of coins therein as above the respective predetermined level, and for effecting delivery of an unacceptable item to a return system of the vendor.

4,286,704

COIN-VALIDATING ARRANGEMENT

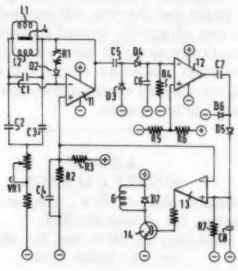
Dennis Wood, Oldham, England, assignor to Coin Controls Limited, Royton, England

Filed Apr. 22, 1980, Ser. No. 142,682

Claims priority, application United Kingdom, Apr. 27, 1979, 14716/79

Int. Cl.³ G07F *3/02*

U.S. Cl. 194—100 A **18 Claims**



1. A coin-validating arrangement, comprising

(a) coin guide means defining a coin guide path (**3**);

(b) oscillation circuit means including

(1) fixed biased amplifier means (**11**) having input and output terminals;

(2) tuned circuit means including at least one coil arranged adjacent said coin guide path, said tuned circuit means being connected between said amplifier output and input terminals to define a negative feed back path; and

(3) means including a variable resistor (VR1) for applying to said tuned circuit means a potential normally producing a phase shift sufficient to result in positive feedback in said amplifier means and oscillation of said oscillation circuit means, said oscillation circuit means being operable to a non-oscillating quenched condition when a given coin having predetermined physical characteristics is temporarily positioned adjacent said coil;

(c) normally closed acceptance gate means (**7**) arranged in said coin path;

(d) detecting means for detecting the quenching of the oscillations of said oscillation circuit means by said given coin; and

(e) means operable by said detecting means when said oscillation circuit means is in the quenched condition for opening said acceptance gate means, thereby to permit the passage of the given coin therethrough.

4,286,705

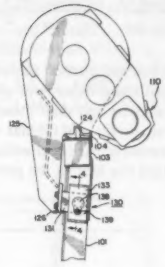
SCRAPER ELEVATOR DRIVE MOUNTING

Richard F. Boersma, Springfield, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 749,820, Dec. 13, 1976, Pat. No. 4,179,024. This application Sep. 5, 1978, Ser. No. 939,244

Int. Cl.³ B65G *19/00, 23/06*

U.S. Cl. 198—719 **6 Claims**



1. A mounting for a drive gear assembly operatively connected to a drive sprocket assembly of a flight-type elevator for isolating torsional stresses incurred during loading of material comprising

a material loading elevator means including an elevator frame and a plurality of material conveying flights supported thereon for movement in a predetermined endless path of movement for loading materials,

said plurality of material conveying flights being supported by said elevator frame upon a rotatable drive sprocket assembly and rotatable idler wheels carried by said elevator frame,

said drive sprocket assembly having a driven end operatively connected to a drive gear assembly for rotating said drive sprocket assembly to move said plurality of material conveying flights in an endless path of movement,

a cantilevered support arm carried by said elevator frame for supporting said drive means,

said cantilevered support arm being supported by mounting means upon said elevator frame to effect movement in a plane transverse to the rotational axis of said drive sprocket assembly in response to a predetermined force being applied to one of said plurality of material conveying flights during loading of material, said mounting means comprises a bushing block which torsionally rotates about a longitudinal axis through a resilient bushing.

4,286,706

BELT TRACKING SYSTEM

Vittorio Castelli, Scarsdale, and Ralph A. Hamaker, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 19, 1979, Ser. No. 50,271

Int. Cl.³ B65G *39/16*

U.S. Cl. 198—806 **6 Claims**

1. An apparatus for controlling the lateral alignment of a belt arranged to move along a pre-determined path, including:

a tubular member arranged to support the portion of the belt passing thereover;

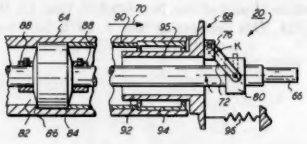
a substantially stationarily mounted shaft member disposed interiorly of and spaced from said tubular member;

means for rotatably and pivotably mounting said tubular member on said shaft member;

a ring extending in an outwardly direction from said tubular member and arranged to have a portion thereof positioned

closely adjacent to the side edge of the belt so that lateral movement of the belt causes the side edge of the belt to contact said ring and translate said ring in the lateral direction;

means for translatably securing said ring on said tubular member; and



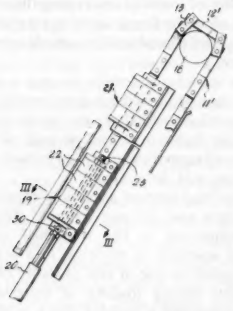
a bracket having one end portion thereof attached pivotably to said ring with the other end portion thereof being attached pivotably to said shaft member so that the translation of said ring pivots said tubular member about an axis substantially normal to the longitudinal axis of said tubular member to return the belt to the pre-determined path.

4,286,707

DEVICE FOR DRIVING AN ENDLESS CHAIN

James D. Menzies, Carlisle, England, assignor to Simonacco Limited, Carlisle, England

Filed Sep. 11, 1979, Ser. No. 74,537
Int. Cl.³ B65G *23/38, 25/04*
U.S. Cl. 198—859 **7 Claims**



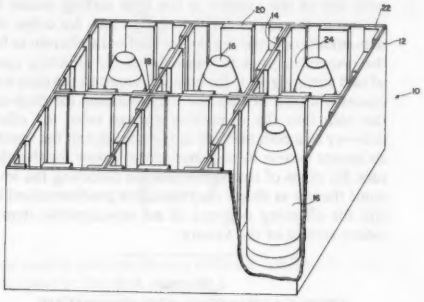
1. A drive system for a pair of laterally spaced parallel endless chains mounting between them one or more load carrying members, each of said chains comprising linearly movable flights, said drive system comprising means movable parallel to the chains in a reciprocating manner, reciprocating drive means for said movable means, and said movable means including one or more slippers adapted to grip at least one chain flight and thus drive at least one of the chains in one direction of movement of said movable means and to permit free movement of the latter relative to the chains in the opposite direction, and means operatively associated with a chain flight for preventing reverse movement of the chains and being of similar construction to said movable means but being fixed, such that at least one of the chain flights may move therethrough in the driven direction but be prevented from movement in the opposite direction, whereby said chains may be advanced intermittently in one direction said one or more slippers being movable on one or more rollers attached thereto and adapted to run along a fixed rail or rails.

4,286,708

MODULE TO PREVENT SYMPATHETIC DETONATIONS IN MUNITIONS

Francis B. Porzel, Falls Church, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 21, 1979, Ser. No. 68,355
Int. Cl.³ B65D *81/08, 85/30;* **F42B** *37/00, 39/00*
U.S. Cl. 206—3 **31 Claims**



1. An explosive unit storage means comprising:

at least one storage cell for storing an explosive unit therein;

at least one frangible sympathetic detonation prevention means proximate to said storage cell,

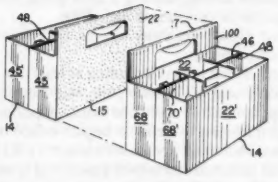
whereby the pressure wave generated by a detonation of an explosive unit contained within said storage cell will be reduced in kinetic energy upon passing through said prevention means and thereby will lack sufficient energy to detonate any adjacently located explosive unit, wherein the detonation prevention means comprises at least one carrier element extending across the opening between explosive units and an energy absorption means supported by the said carrier element.

4,286,709

BOTTLE PACKAGE

Guelfo A. Manizza, Blauvelt, N.Y., assignor to Federal Paper Board Company, Inc., Montvale, N.J.

Filed May 21, 1979, Ser. No. 40,728
Int. Cl.³ B65D *75/00*
U.S. Cl. 206—144 **3 Claims**



1. A basket type container for packaging a plurality of articles having the general form of beverage bottles, comprising a multiple article accommodating cellular tray structure for a double row of bottles arranged on each side of a multi-panel vertical partition and handle structure, each said tray structure being formed from a single cut and scored paperboard blank each said tray structure comprising a sidewall forming panel and a panel forming member of said partition and handle structure which are hinged at opposite ends to collapsible end wall forming panel members, a pair of hingedly connected collapsible bottom wall forming members which are hinged to the

bottom edges of a sidewall forming member and an associated panel member of said partition and handle structure and which are adapted to collapse downwardly into the plane of said associated sidewall and partition panel member, and a collapsible cell structure secured between said sidewall forming member and said partition and handle structure, which, when opened up, is adapted to provide a double row of upwardly opening article receiving cells arranged on each side of said partition and handle structure, said partition and handle structure having the panels thereof adhesively secured together and having top portions with aligned finger accommodating openings therein which top portions extend above the adjoining cell forming structure and constitute a handle for grasping the same so as to enable the package to be conveniently carried, said top portions being secured together and each including an outer reinforcing and facing panel integrally hinged along the top edge to said panel and folded and secured to adjoining depending top portions of said panel which face in the direction of the article receiving cell structure hinged thereto and inner reinforcing panel members hinged to opposite ends of and secured beneath said facing panel, said collapsible cell structures comprising a row separating multi-panel partition structure hinged at opposite ends to the associated collapsible end wall panel members at their hinged connection so as to enable said end wall panel members to collapse in the same direction and into the plane of said row separating partition and cross partition panel members which are cut from panels constituting said row separating partition structure and hinged thereto in cell forming relation and having a hinged connection to opposed faces of the associated sidewall and partition and handle structure for collapse into the plane of said partition and handle structure.

4,286,710

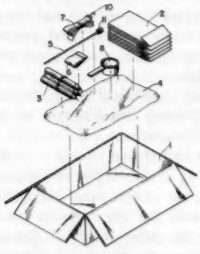
CHRISTMAS CANDLE PACKAGE

Janet D. Higgins, 157 Candlewick La., Bridgewater, N.J. 08807

Filed Nov. 28, 1979, Ser. No. 98,120

Int. Cl.³ B65D *77/00, 85/00*

U.S. Cl. 206—216 **1 Claim**



1. A Christmas candle package comprising: a container having a bottom, sides and a foldable top and containing:

a quantity of sand;

a means for measuring sand into an open bag;

one or more bags having walls of sufficient stiffness so that when a bag is opened and partially filled with sand the walls will remain erect, said bag having an opening in its wall to permit a hook to be inserted and hooked against the inside of the wall;

a tape measure having a hook at one end for engaging said bag wall through said opening to permit the user to measure off the distance between a bag, held in stationary position by the sand in the bag, and another bag;

one or more candles;

one or more matches; and

a candle lighter for holding a match to light a candle when the candle is in upright position in the sand in said open bag, said lighter comprising a wire having a bent loop with parallel sides at one end and a slider surrounding the two parallel sides to compress the parellel sides and to permit the sides to engage a match inserted into the loop for lighting the candle in each successive bag to form a row of upright candles held in the sand and protected from the wind by the surrounding walls of the bags.

4,286,711

TWO-WAY CONTAINER PACKAGE

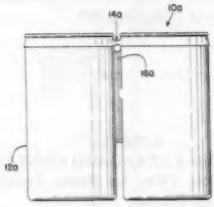
John R. Platt, Wheaton, and Edward L. Benno, Grayslake, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 31,565, Apr. 19, 1979, Pat. No. 4,234,082.

This application Jul. 21, 1980, Ser. No. 170,270

Int. Cl.³ B65D *81/00, 85/62*

U.S. Cl. 206—216 **2 Claims**



1. In a carrier package for containers or the like which includes features permitting the formation of a secondary package of said containers when their contents have been removed, the combination of a plurality of containers and a carrier device retaining said containers in a primary package configuration relative to each other, a plastic bag having a volume capacity not less than the total volume of said plurality of containers and of internal dimension sufficient to accept and retain all of said plurality of containers and to permit said bag to be closed with said plurality of containers retained therein, and said plastic bag in an empty collapsed condition releasably carried in said primary package, wherein the bag is folded in a flat planar condition having predetermined length and width dimensions in said folded condition, said plurality of containers being arranged into an array of rows and ranks, said folded bag being retained in the package beneath the carrier and wedged between containers within the perimeter of the package.

4,286,712

MULTI-LAYERED FOIL CIGARETTE PACK INCLUDING METHOD AND APPARATUS FOR PRODUCING A TEAR LINE IN THE FOIL

Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co., Verden, Fed. Rep. of Germany

Filed Sep. 24, 1979, Ser. No. 78,268

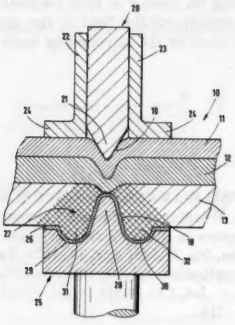
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1978, 2844238

Int. Cl.³ B65D *85/10, 65/28, 5/54*

U.S. Cl. 206—264 **8 Claims**

1. A cigarette pack made of a multi-layered, composite bonded foil having a moisture and aroma proof layer of metal foil, and an exterior layer of a thermoplastic material, particularly polyethylene, and having a premarked tear line on the foil

defining a removable flap for opening the pack, characterized by: the tear line **(14)** having a reduced thickness formed by the



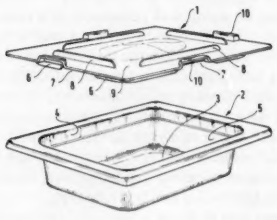
thermal deformation of at least the thermoplastic layer **(13)** and a reduced thickness of said metal foil.

4,286,713

COVER FOR A STANDARD CONTAINER

Jean-Claude Marchais, l'Hay les Roses, France, assignor to CIDELCEM, Paris, France

Filed Jan. 22, 1980, Ser. No. 114,163
Claims priority, application France, Jan. 24, 1979, 79 01788
Int. Cl.[3] B65D *21/02*
U.S. Cl. 206—508 **6 Claims**



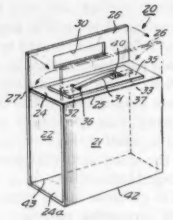
1. A cover for a standard container, said container having a substantially rectangular bottom with rounded corners and side walls that are outwardly flared upwards, the tops of the side walls delimiting a substantially rectangular opening with rounded corners, said cover being constituted by a plate guide made of a thermo-plastic material and provided with upper rib portions which project from its upper surface in a rectangular configuration with gaps therebetween and with lower rib portions which project from its lower surface in a substantially rectangular configuration to fit into the opening; the improvement wherein the upper rib portions **(8)** surround the bottom **(3)** of an underlying container **(2)** placed on the cover **(1)** and wherein said cover **(1)** has only one set of lower rib portions **(6)** which fits inside the opening **(5)** of a container closed by the cover and said set of lower rib portions **(6)** defining a rectangular configuration and being of a slightly different size to that formed by the set of upper rib portions **(8)** so that the bottom **(3)** of the standard container **(2)** placed on the cover **(1)** cannot move sideways, and likewise another cover **(1')** identical to the cover **(1)** in question and stacked thereon, and wherein said lower rib portions **(6)** being separated by gaps **(7)** which are not adjacent to gaps **(9)** separating the upper ribs **(8)**.

4,286,714

SLEEVE WITH PRE-APPLIED HANDLE FOR SETUP BOX OR FOLDING CARTON

Robert C. Zdarsky, Westchester, and Russell Lyons, Franklin Park, both of Ill., assignors to Champion International Corporation, Stamford, Conn.

Filed Oct. 19, 1979, Ser. No. 86,467
Int. Cl.[3] B65D *5/46*
U.S. Cl. 206—526 **4 Claims**



1. A sleeve and handle for a rectilinear package; said sleeve being adapted to maintain the package in closed position when placed on said package; said handle being connected to and a part of said sleeve;

said sleeve comprising a tubular member having a pair of side walls each connected by hinge lines to a top and bottom wall; said tubular member being erectable and collapsible around said fold lines;

said sleeve when erected comprising a pair of opposed parallel side walls and opposed parallel top and bottom walls; the cross-sectional area of said erected tubular sleeve being of a dimension to match corresponding dimensions of said package;

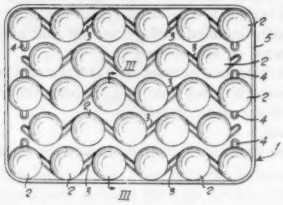
said sleeve being capable of being slipped on and off said package and being dimensioned to have a substantial frictional fit on said package;

the top wall of said sleeve having a handle formed therein and comprising at least a pair of superimposed upper and lower panels; one of said panels being hingedly connected to one side wall; the other of said panels being hingedly connected to the other side wall; the upper panel of said superimposed panels having a slot therein; a flexible handle member secured between said superimposed panels and extending in said slot; said handle member being depressible into said slot to be wholly within the boundary of said upper panel; said handle being capable of being raised out of said slot for grasping by the hand and comprising a ribbon; the ends of said ribbon being secured to the lower of the two superimposed panels forming the top wall and at least one section of the ribbon adjacent one end of the slot being prefolded to ensure a controlled collapse of said handle within said slot, said top wall further including a reinforcing member for further securing said handle member to said lower panel and to reinforce said slot in said upper panel, said reinforcing member including a single sheet with openings therein, said sheet being adhesively secured to the upper surface of said lower panel with the ends of said ribbon handle being captured through said openings, between said sheet and said lower panel.

4,286,715
RECTANGULAR TRAY FOR PACKING AND CONVEYING SPHEROIDAL FRUIT

Nerio Martelli, and Giuliano Strazzari, both of Bologna, Italy, assignors to Nespak S.p.A. Societa Generale Per l'Imballaggio, Massa Lombarda, Italy

Filed Aug. 31, 1979, Ser. No. 71,677
Claims priority, application Italy, Sep. 12, 1978, 12788 A/78
Int. Cl.[3] B65D *1/34*
U.S. Cl. 206—564 20 Claims

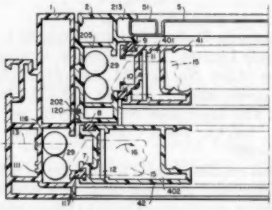


1. A rectangular tray formed of a thin-walled material of essentially uniform thickness for packing and conveying generally spheroidal objects, comprising, depressions for accommodating one object each, and stiffening channels recessed into one major surface of the tray and projecting from the other major surface of the tray, the depressions being concave when viewed from the top of the tray and convex from the bottom of the tray, and being arranged in straight rows which are parallel to one peripheral edge of the tray with the depressions in each row being staggered relative to the depressions in adjacent rows, and wherein in at least some of the rows of depressions the majority of depressions are connected to adjacent depressions by said stiffening channels which are disposed at an oblique angle to the direction of that row, whereby buckling of the tray is resisted along lines parallel to the peripheral edges of the tray.

4,286,716
BUILDING KIT FOR VERTICAL OR HORIZONTAL SLIDING WINDOWS

Wolfgang Budich, and Hans Theissen, both of Troisdorf-Eschmar, Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Oct. 2, 1979, Ser. No. 81,148
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1978, 2842884
Int. Cl.[3] B65D *71/00*
U.S. Cl. 206—577 32 Claims

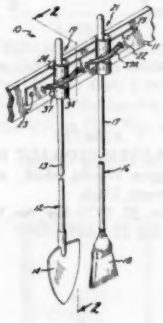


1. A building kit for vertically or horizontally displaceable windows which include a blind frame means and hollow profile sash means, characterized in that the blind frame means is formed of a blind frame profile member and includes a substantially planar wall on a side thereof adapted to face the sash means, a projecting guide strip means is disposed substantially centrally of the planar wall and extends in a longitudinal direction of the blind frame profile member, an undercut guide groove means opens into the planar wall, chamber means arranged on each side and below said guide groove means, a U-shaped end profile means is adapted to be arranged on the blind frame profile member for sealing an inside of the sash means, and in that means are provided for connecting the end profile means to the blind frame profile member, said connecting means are adapted to enable the end profile means to be selectively guided on one of the projecting guide strip means or in an opening of the guide groove means.

4,286,717
HANGER FOR SLENDER ARTICLES

James O. Liesinger, 4543 Snelling Ave. South, Minneapolis, Minn. 55402

Filed Oct. 15, 1979, Ser. No. 84,798
Int. Cl.[3] A47F *7/00*
U.S. Cl. 211—60 T 40 Claims



1. An apparatus for holding an object having an elongated generally cylindrical handle comprising: first means adapted to be attached to a support structure, a tubular member attached to the first means, said tubular member having an inside wall providing a linear passage to accommodate the handle, said tubular member having open opposite ends aligned with the passage whereby the handle can extend through the passage of the tubular member, and said tubular member having edge means providing an opening in the tubular member open to a side of said passage between the open ends of the tubular member, said edge means comprising a first edge and a second edge, said first and second edges diverging outwardly from opposite side portions of the tubular member and surrounding said opening; spring means extended across said opening engageable with the first and second edges, said spring means engageable with the handle when the handle is in the passage to hold the handle in fixed relation to the tubular member; and third means connecting the spring means to the first means.

4,286,718
DISPLAY AND STORAGE RACK

Leonard Flax, New York, N.Y., assignor to The Frame Company, Inc., Jersey City, N.J.

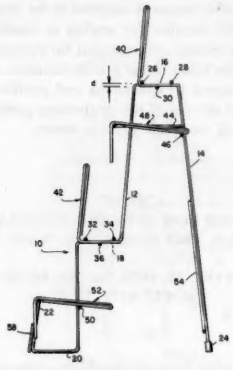
Filed Feb. 4, 1980, Ser. No. 118,400
Int. Cl.[3] A47F *5/01*
U.S. Cl. 211—181 4 Claims

1. A display and storage rack for picture frames that have a horizontal base member, said rack comprising:

spaced, parallel end pieces;

three spaced parallel display frame support rods extending between said end pieces, the outer two rods being vertically spaced from the inner rod by a distance equal to the

thickness of said frame base member, forming a tripartite support for a picture frame base member; and



two parallel storage frame support rods extending between said end pieces below said display frame support rods and adapted to support a stack of said frames.

4,286,719

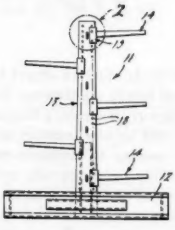
CANTILEVER STORAGE RACK

Lee Z. Hall, Huntington Woods, Mich., assignor to Palmer-Shile Company, Detroit, Mich.

Filed Nov. 27, 1979, Ser. No. 97,682

Int. Cl.³ A47F *5/00*

U.S. Cl. 211—193 **5 Claims**



1. In a cantilever storage rack of the type having a column of rectangular cross-sectional shape, pairs of vertically spaced apertures in the sides of the column, a load supporting arm, and a channel shaped bracket secured to the inner end of said arm and adapted to fit around said column, the improvement comprising upper and lower pairs of apertures in the flanges of each bracket aligned with apertures in said column, and a pair of pins passing through the apertures in said bracket and column, the pins and apertures being so shaped and positioned that the web of the said channel shaped bracket will be spaced from said column and both pins will have area load bearing contact with said column and bracket.

4,286,720

COUNTERWEIGHT REMOVAL SYSTEM AND METHOD

John Atkinson, Bishop Auckland, England, assignor to Coles Cranes Limited, Sunderland, England

Filed Aug. 30, 1979, Ser. No. 70,956

Claims priority, application United Kingdom, Sep. 5, 1978, 35701/78

Int. Cl.³ B66C *23/74*

U.S. Cl. 212—178 **10 Claims**

1. A method of preparing a mobile crane for travelling from one working site to another, said mobile crane comprising a platform, an upwardly inclined surface on said platform, a jib and superstructure mounted for slewing on said platform, a jib pivoted to said superstructure, an extensible beam assembly carried by said superstructure and a counterweight attached to said beam assembly, said counterweight having an underside inclined at a substantially equal angle to the horizontal as said upwardly inclined surface, in which:

said jib structure is slewed to position said counterweight adjacent said upwardly inclined surface,

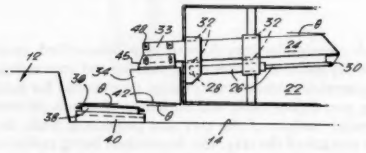
said counterweight is moved by said beam assembly in a direction away from said superstructure to engage said underside of said counterweight and said upwardly inclined surface and cause said counterweight to ride up said upwardly inclined surface so that said counterweight is supported on said surface,

and detaching said counterweight from said beam assembly and tieing it down onto said platform for travelling.

5. A mobile crane comprising:

a platform,

a jib superstructure mounted for slewing on said platform,



an upwardly inclined surface on said platform wherein the elevation of said upwardly inclined surface above said platform increases as the distance from said superstructure increases,

a jib pivoted to said superstructure, an extensible beam assembly carried by said superstructure,

a counterweight attached to said beam assembly to assist in balancing a load on said jib, said counterweight having an underside inclined at a substantially equal angle to the horizontal as said upwardly inclined surface,

said upwardly inclined surface being capable of supporting a counterweight during travelling, and

said upwardly inclined surface being positioned and arranged so as to be able to engage said underside of said counterweight upon movement as said beam assembly after said superstructure has been slewed to an appropriate position, continued movement of said beam assembly causing said counterweight to ride up said inclined surface and be supported thereby.

4,286,721

ACCESS EQUIPMENT

Denis H. Ashworth, Dudley, England, assignor to Simon Engineering Dudly Limited, West Midlands, England

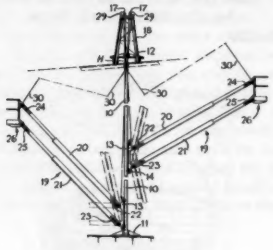
Continuation of Ser. No. 826,121, Aug. 19, 1977, abandoned, which is a continuation of Ser. No. 623,632, Oct. 20, 1975, abandoned. This application Nov. 13, 1979, Ser. No. 93,438

Int. Cl.³ E04G *1/36*; B66C *23/06*

U.S. Cl. 212—199 **11 Claims**

1. Apparatus enabling access to the interior surfaces bounding a large space such as a ship cargo tank comprising a rigid pole suspended at its upper end with its lower end unsupported vertically adapted to extend vertically through the height of the space with its lower end located at the base of the space, a wheeled carriage mounted for vertical movement along said pole, at least one boom structure pivotally connected at one end with said carriage, a working platform connected to the end of said boom structure remote from said pole, powered means adapted to be located above and outside the tank operably connected to said wheeled carriage for adjusting the height of said boom structure within said space, means operable by an

operator on said working platform for adjusting the boom structure for moving the working platform vertically and toward or away from said pole, and means whereby said lower



end of the pole is located in a fitting adapted to be mounted in the tank to operatively receive the base of the pole so as to restrain the pole against lateral or rotational movements.

4,286,722

CONTAINER LOADING CRANE WITH ROTATABLE HOISTING FRAME

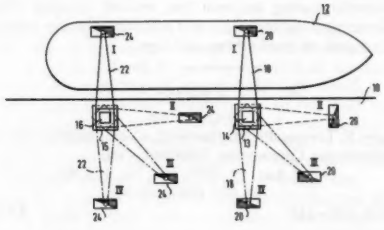
Hans Tax, Potsdamer Strasse 3, Munich, Fed. Rep. of Germany (8000), and Klaus Hösler, Eichenau, Fed. Rep. of Germany, assignors to Hans Tax, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 810,879, Jun. 28, 1977, abandoned. This application Jun. 13, 1979, Ser. No. 48,048

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1976, 2630182

Int. Cl.³ B66C *23/00*

U.S. Cl. 212—242 **14 Claims**



1. In a container loading crane including a a base frame, a boom extending from said base frame and having a free end spaced outwardly from said base frame, a plurality of elongated tension members depending from the free end of said boom, winch means mounted on said base frame and said tension members connected to said winch means and extending therefrom to the free end of said boom for varying the effective depending lengths of said tension members, a horizontally extending, elongated container hoisting frame carrying connector means for rigidly fastening a shipping container to said container hoisting frame, each of said tension members being secured to said container hoisting frame for raising and lowering the frame in response to the varying dependent lengths of the tension member, and turning means for turning said container hoisting frame about a vertically extending axis, the improvement in said turning means which comprises:

(a) a first turntable assembly pivotally mounted about a horizontal pivot axis on the free end of said boom and secured thereto against rotation about the vertically extending axis;

(b) a second turntable assembly mounted on said first turntable assembly for rotation about the vertical extending axis assembly;

(c) drive means for turning said second turntable assembly relative to said first turntable assembly and the free end of said boom about said vertically extending axis,

(1) said turntable assemblies defining respective portions of a vertical passage therethrough,

(2) said tension members extending through said passage;

(d) first securing means on said second turntable assembly and second securing means on said hoisting frame associated with each of said tension members and securing respective, longitudinal parts of the associated tension member to said second turntable assembly and to said hoisting frame;

(e) said first and second turntable assemblies being fixed in the vertical direction with respect to said horizontal pivot axis; and

(f) said plurality of tension members being twisted about said vertically extending axis when said second turntable assembly is rotated with respect to said first turntable assembly.

4,286,723

COMPOSITE STEEL-JACKETED PLASTIC BARREL

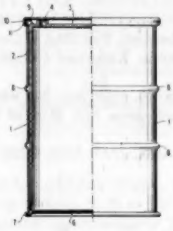
Udo Schutz, Ruckersteg 4, D-5418 Selters, Westerwald, Fed. Rep. of Germany

Filed Jan. 14, 1980, Ser. No. 111,849

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1979, 2948083

Int. Cl.³ B65D *8/06*

U.S. Cl. 220—5 R **1 Claim**



1. A composite barrel comprising a sheet steel shell having a lower sheet steel end wall flanged to the shell, an inner plastics container blow-molded in one piece including a bottom wall, a tubular body, and a top wall, said top wall forming the upper end wall of the composite barrel, said container having a wall thickness which decreases uniformly from the upper end to said bottom wall resting adjacent said lower sheet steel end wall, the upper end wall of the inner plastics container and the upper end of the sheet steel shell each having a radially outwardly projecting peripheral rim, and a clamping ring detachably interconnecting the respective rims.

4,286,724

FLUID TANK ARRANGEMENT WITH CLOSURE

Ivan Andersson, Hänavägen 23,, 826 04 Söderhamn, Sweden

PCT No. PCT/SE78/00065, § 371 Date Jun. 28, 1979, § 102(e) Date Jun. 25, 1979, PCT Pub. No. WO79/00241, PCT Pub. Date May 3, 1979.

This PCT application filed Oct. 26, 1978, Ser. No. 117,491

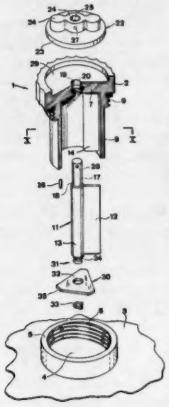
Claims priority, application Sweden, Oct. 28, 1977, 7712169

Int. Cl.³ B65D *1/24, 1/36, 57/00*

U.S. Cl. 220—20.5 **11 Claims**

1. A fluid tank arrangement of the kind to deliver a fluid to a consumption unit and comprising a reserve fluid container (16), which is operable to deliver the reserve fluid into the tank (3) when the fluid in the tank has been consumed, said container being arranged to be located in association with a filling hole (4) in the tank, characterized in that said container is combined with a cap (1) for the filling hole in the tank so as to

compulsorily follow the cap when it is removed from and replaced onto the tank and that the container is compressible



and of a dimension smaller than the filling hole so that, when containing said reserve fluid, is adapted to retain the reserve fluid independently of the position of the cap and the tank.

4,286,725

VESSEL FOR COLLECTING AND EXTINGUISHING COMBUSTIBLE LIQUIDS

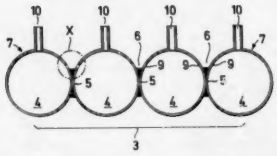
Paul Menzenhauer, Bruchsal, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Sep. 29, 1978, Ser. No. 946,871

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1977, 2744267

Int. Cl.[3] **A62C** *1/18, 3/06;* **G21C** *9/04*

U.S. Cl. 220—23.2 **3 Claims**



1. A vessel for collecting liquid, comprising a plurality of hollow bodies each having a length dimension: said hollow bodies being arranged side-by-side parallel to their length dimension and being secured to one another to form an assembly; each said hollow body defining an enclosed inner chamber for accommodating the liquid; the chambers of the respective hollow bodies being separated from one another; each hollow body having an outer upper surface inclined downwardly in a direction transverse to said length dimension; the inclined upper surfaces of any two adjoining hollow bodies together form a trough extending parallel to said length dimension; each trough having a bottom and drainage openings at said bottom for providing passage of the liquid from each trough into said inner chambers underneath the respective troughs; each hollow body further having an external apical portion; and further comprising a vent pipe secured to each hollow body in said apical portion thereof and extending vertically upwardly from said apical portion; each vent pipe defining a vent opening maintaining communication between the respective inner chamber and the ambient atmosphere.

4,286,726

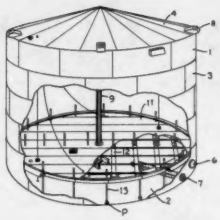
FLOATING DECK LEG BOOTS

Gary J. Madsen, Spring Lake, Mich., assignor to Gary Madsen and Ronald Vargo, both of Spring Lake, Mich.

Filed Oct. 4, 1979, Ser. No. 81,981

Int. Cl.[3] **B65D** *88/40, 88/34*

U.S. Cl. 220—220 **6 Claims**



1. In a liquid containing tank having a bottom, generally vertical side walls and a floating cover for cooperating with said bottom and side walls to enclose liquid contained within said tank, said cover having a plurality of downwardly extending legs for contacting said bottom and holding said cover spaced from said bottom when liquid is at least substantially withdrawn from said tank, the improvement comprising:

means defining a lengthwise opening in each said leg;

a resilient pad fixed to the bottom of each of said legs for engaging the bottom of said tank and preventing direct contact between said bottom and the lower end of each of said legs whereby to eliminate scratching or gouging of said bottom by the lower end of said legs, each said pad having a vertical opening communicating at its upper end with the lengthwise opening in a said leg to which it is attached, and each said pad having a transverse opening communicating between the vertical opening near its lower end and the exterior of said pad, whereby said liquid can seek its level within said legs.

4,286,727

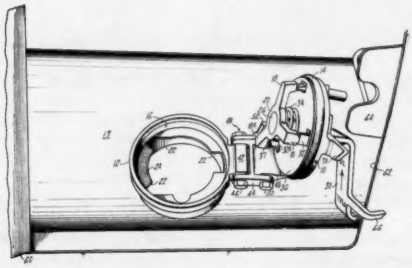
TANK CAP

Anthony F. Limoncelli, Marlborough, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 19, 1980, Ser. No. 179,397

Int. Cl.[3] **B65D** *45/00*

U.S. Cl. 220—244 **6 Claims**



1. In combination, a cap for an oil tank mounted in an aircraft having an access door mounted in proximity to the cap and retractable to allow access to the cap, said cap having a circular body adapted to fit into the neck of the tank, a seal around the periphery of said circular body engaging the wall of the neck for sealing the fluid contained by the tank, a hub having lug elements extending radially and fitting complimentary recesses formed in a lip in said neck, a plunger rod extend-

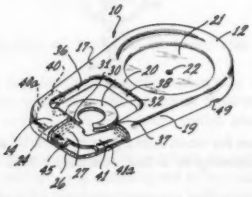
ing through said circular body connected to said hub for rotating said lugs and positioning said lugs relative to said circular body, a handle mounted on one end of said plunger rod remote from said lugs for rotating and positioning said lugs, said cap being hingedly connected to said neck, said hinge connection including a pair of tandem mounted hinges, one of said hinges being connected to said neck and the other of said hinges being connected to said cap, a hinge element disposed between said neck and cap hingedly supporting said cap to said neck for obtaining relative parallel movement of said seal relative to the wall of said neck when said cap is being placed in an open and closed position, an extension element on said handle, a cooperating cam therefor extending from said neck for limiting rotation of said handle in a given direction when the cap is in the fully retracted position, and means on said handle preventing closure of said access door when said cap is in the unsecured condition.

4,286,728

TAB AND ECOLOGY END

Ermal C. Fraze, 355 W. Stroop Rd., Dayton, Ohio 45429, and Omar L. Brown, Dayton, Ohio, assignors to Ermal C. Fraze, Dayton, Ohio

Filed Apr. 11, 1980, Ser. No. 139,248
Int. Cl.³ B65D *17/34*
U.S. Cl. 220—270 **14 Claims**



1. In a tab for use with an easy opening end structure wherein said tab is formed of metal sheet material, and which includes a lifting end and an opening end with an ear therebetween, the ear including an aperture through which a rivet may extend for attachment of said tab to an end wall, spaced side legs formed of a curled double layer of sheet material and extending between the opening end and at least to the rear of said ear, and wherein said opening end is formed of multiple layers of sheet material, the improvement comprising:

one of the multiple layers forming the opening end of said tab including finger means extending towards the lifting end of said tab and positioned within the double layer of said spaced side legs, and

said finger means including flange means extending lengthwise thereof to form ribs stiffing said tab along its length.

4,286,729

TAPE DISPENSER PACKAGE WITH CORE FRICTION RING

Gerald T. Downing, Port Washington, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

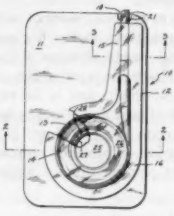
Filed Nov. 15, 1979, Ser. No. 94,475
Int. Cl.³ B65D *85/672*
U.S. Cl. 221—70 **3 Claims**

1. In a tape package of the type comprising

(a) a base member, (b) a formed cover element having a housing portion, an exit section and a peripheral flange joined to the base member, and (c) a roll of adhesive tape carried in the housing portion with part of the tape unwound from the roll and extending through the exit section of the cover element, the improvement wherein:

(1) the housing portion of the cover element has a top wall spaced from a bottom wall, and a vertical wall connecting the top and bottom walls; and

(2) a friction ring is supported on the vertical wall and engages the inner surface of the roll of tape to apply restraining force thereagainst as the roll rotates upon removal of



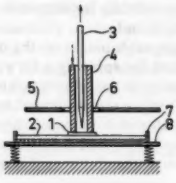
tape from the package, the friction ring being made of compressible felt or plastic foam.

4,286,730

METHOD AND AN APPARATUS FOR APPLYING OBJECTS TO A SURFACE

Magnus Ericsson, 7 Pyramidvägen, Solna, Sweden (S-171 36)

Filed Nov. 27, 1979, Ser. No. 97,831
Int. Cl.³ B65H *3/22*
U.S. Cl. 221—215 **7 Claims**



4. An apparatus for applying objects, such as an antibiotic disc, to a receiving surface, such as the surface of a culture medium, said apparatus comprising supply means holding the objects and means for feeding out the objects from said supply means, characterized by the provision of at least one intermediate surface formed with holes therein, by the provision of at least one pointed needle capable of axial travel from a starting position into a position wherein it will pierce by its point an object lying on said intermediate surface, said intermediate surface being operable to bring one of said holes in alignment with said needle, said needle being further operable to convey said object through said hole down onto the receiving surface, and further by the provision of object retaining means operable to perform a motion cycle independent of that of the needle whereby to keep the object affixed to the receiving surface temporarily during withdrawal of the needle.

4,286,731

SOAP LEAF SHEET DISPENSER

Siebolt Hettinga, De Moines, Iowa, assignor to Parachem Corporation, Des Moines, Iowa

Filed Feb. 7, 1980, Ser. No. 119,639
Int. Cl.³ B65G *59/06*
U.S. Cl. 221—259 **5 Claims**

1. A device for manually dispensing soap leaf sheets comprising:

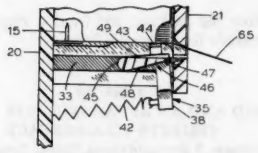
(a) a housing having at least a back wall, a bottom wall with a central opening, a front wall with a dispensing slot adjacent said bottom wall;

(b) a plurality of soap leaf sheets arranged in a stacked relation within said housing with the lowermost sheet of said stack faced toward the bottom wall of said housing;

(c) guideway means on said bottom wall at opposite sides of said central opening;

(d) dispensing means having a body portion with an upright abutment member,

(e) guide means at opposite sides of said body portion movable in said guideway means for guidable movement of said dispensing means between a rearward rest position, wherein said abutment member is out of engagement with said lowermost sheet, and a forward sheet dispensing position, each of said guide means having a front portion and a rear portion and of a shape in transverse cross section providing for a tiltable movement of said guide means about the rear portion thereof within the transverse di-



mension of a guideway means, whereby said dispensing means is tiltable upwardly and forwardly in the rest position therefor for engagement of said abutment member with the lowermost one of said sheets,

(f) bias means for normally holding said dispensing means in said rest position, and

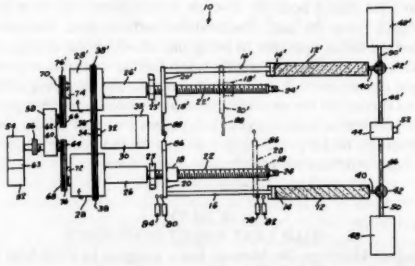
(g) manually engageable means on the body portion of said dispensing means for applying a forwardly directed force on said dispensing means to concurrently tilt said dispensing member to move said abutment member into contact engagement with said lowermost sheet and to move said dispensing member to said forward position to dispense said sheet through the slot in said housing front wall.

4,286,732

VARIABLE RATIO DISPENSING APPARATUS

James R. James, Novi, Mich., and Michael P. Neathery, Louisville, Ky., assignors to Accuratio Systems, Inc., Novi, Mich.

Filed Apr. 16, 1979, Ser. No. 30,062
Int. Cl.³ B67D *5/22*; **F04B** *23/04, 41/06*
U.S. Cl. 222—46 **13 Claims**



1. In an apparatus having a plurality of cylinder and piston assemblies each operable upon relative movement of its piston at a given rate to dispense a fluid from said cylinder at a predetermined rate, and means for varying the rates of said movement in the respective assemblies for varying the ratio of dispensing fluids from said cylinders, improved structure which comprises,

a differential transmission associated with each of said assemblies and having an output connected for producing said relative movement of its piston, each said differential transmission having a first input and a second input,

first motor means drivingly connected with said first input of each of said differential transmissions,

and second motor means drivingly connected with power transmitting means having a plurality of output means each connected with a separate one of said second inputs of said differential tranmissions for varying the rates at which said differential transmissions drive their respective assemblies,

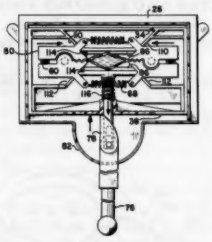
each said second input being responsive to variations in the direction and rate of operation of said second means.

4,286,733

APPARATUS FOR CONTROLLING FLOW OF FLUENT MATERIAL

Roy J. Weikert, 2000 Schlater Dr., Sidney, Ohio 45365

Filed Feb. 6, 1980, Ser. No. 119,053
Int. Cl.³ B65D *35/56*
U.S. Cl. 222—105 **11 Claims**



1. Apparatus for controlling gravity flow of a fluent product through an opening in a bag containing said fluent product comprising:

means for gripping opposed portions of a bag adjacent an opening therein,

means for causing relative movement of said gripping means toward and away from each other including

means for separating said gripping means away from each other to a position of maximum spacing wherein edges of a bag adjacent an opening therein are taut to restrict flow therethrough,

means, distinct from said separating means, for urging said gripping means toward each other to a position of relatively closer spacing wherein the edges of the bag adjacent the opening are relaxed to enhance flow therethrough, and

sealing means operating in conjunction with said gripping means for engaging a bag adjacent an opening therethrough when said gripping means are in said position of maximum spacing to seal against flow through the opening.

4,286,734

LIQUID MIX DISPENSING GUN

Donald R. Tonge, 15 Dakota Grove, Totara Park, Upper Hutt, New Zealand

Filed Jul. 17, 1979, Ser. No. 58,176
Int. Cl.³ B05B *7/30*
U.S. Cl. 222—145 **4 Claims**

1. A fluid mixing and dispensing gun having the facility to receive and mix prior to dispensing two different liquids comprising;

a molded housing formed in two parts adapted to be assembled together to form a hollow casing in the shape of a gun having a barrel region and a hand grip;

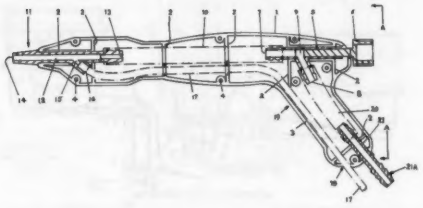
a valve unit separately formed and implaceable in said housing at the hand grip end of said barrel, said valve unit comprising a conduit having an inlet and an outlet, a valve means to control the flow of liquid in said conduit, and a

valve control means external of said housing to control the position of said valve;

a nozzle unit separately formed and implaceable in said housing at the outer end of said barrel, said nozzle unit comprising a main conduit having an inlet at its inner end within said barrel and a nozzle outlet at its other end external of said barrel, a second nozzle unit conduit connected to said main conduit at one end and having a second inlet at its other end;

a first tube member implaceable within said barrel and adapted to be removably connected at its ends in fluid tight engagement with said valve unit conduit outlet and said nozzle main conduit inlet;

a liquid hose connector separately formed and implaceable within the lower portion of said hand grip of said housing comprising a conduit having an inlet at one end external to



said housing and an outlet at its other end within said housing;

a second tube member implaceable within said housing and adapted to be removably connected in fluid tight engagement at its ends to said connector outlet and said valve unit conduit inlet;

flexible tubing removably implaceable at its outlet end portion within said housing and adapted to be connected at its outlet end in fluid tight engagement with said nozzle unit conduit second inlet, said flexible tubing extending through the lower portion of said hand grip; and

said gun when assembled being such that when a first liquid is fed through said hose connector valve unit and nozzle unit and said flexible tubing is connected to a source of second liquid, said second liquid is drawn into and mixed with the stream of first liquid within said nozzle unit.

4,286,735

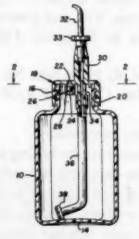
SQUEEZE DISPENSER WITH FLEXIBLE CONDUIT WITH ATTACHED, WEIGHTED AND GROOVED END

Vincent R. Sneider, 3422 Hampton Hall, Atlanta, Ga. 30319

Filed Aug. 14, 1979, Ser. No. 66,439

Int. Cl.[3] B05B *11/04*; B67D *5/60*

U.S. Cl. 222—189 **7 Claims**



1. A hand held squeeze dispenser for fluid and/or powder which includes:

(a) a flexible container having an outlet at one end and with the sidewall portions thereof longitudinally fluted so as to be readily collapsible by manipulation such as squeezing to reduce the interior volume of the container, said container having the sidewall portion sufficiently stiff to return unassisted to an "as formed" condition and shape after said collapsing actuation;

(b) a closure cap mounted on the outlet of the container, said mounted cap adapted to retain the contents of the container absent spillage and leakage when and while the container is maintained in substantially an upright condition;

(c) an outlet of generally tubular construction formed in and on said cap so as to receive and retain a discharge spout;

(d) a valve carried in said cap and adapted to close under the influence of air being moved from the container as the container is collapsed and to open and pass air into the interior of the container through said valve when the container is relaxed to resume and assume said "as formed" condition;

(e) a conduit retainer of generally tubular configuration and formed on the inner side of the cap, said conduit retainer in flow communication with the outlet of the cap;

(f) a flexible plastic tubing attached to said conduit retainer on the inside of the cap, said flexible tubing providing a flow passageway through said tubing, the conduit retainer and thence to the outlet, said flexible tubing of a length sufficient to bring its unconnected end to at least a proximate relationship with the bottom of the container when and while in a stored condition;

(g) an enlarged end provided on the unconnected end of the flexible tubing, said enlarged end being a molded component with a substantially central passageway extending to the flexible tubing and providing a common conducting flow passageway from the enlarged end to the flexible tubing, said enlarged end and the central passageway including radially disposed grooves formed in an open face portion of the enlarged end, said grooves extending from the outer periphery of the enlarged end to the substantially central passageway, and

(h) a cover member and means for securing said cover to the open end of said enlarged end, said cover so constructed and configured that when secured the grooves are covered except for their outer end portions and providing radial conducting paths, said enlarged end and cover providing sufficient weight to carry the flexible tubing and its connected enlarged end to the bottom of the container when and while in a substantially upright condition.

4,286,736

LIQUID DISPENSER

Douglas F. Corsette, Los Angeles, Calif., assignor to Diamond International Corporation, New York, N.Y.

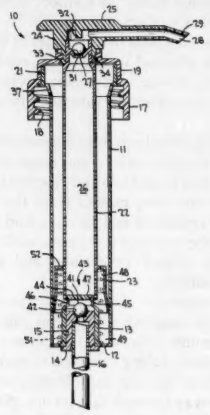
Filed Feb. 20, 1980, Ser. No. 123,168

Int. Cl.[3] G01F *11/04*

U.S. Cl. 222—321 **4 Claims**

1. A fluid dispensing pump comprising, a pump cylinder having a collar at one end, a plunger reciprocably disposed in said cylinder and having a discharge head at one end outwardly of said collar, said head having a fluid discharge opening, said plunger having a discharge passage extending therethrough and communicating with said opening, check valve means in said cylinder to only permit movement of fluid from an inlet into said cylinder, means acting between said head and said collar for locking said head in a depressed and immobilized position, said valve means including a check valve and a cage surrounding said valve, means on said plunger sealingly engaging a portion of said cage when said head is locked in said depressed and immobilized position, and said cage having an

intake port therein disposed outwardly of said engaging means, whereby flow of fluid beyond said engaging means into said



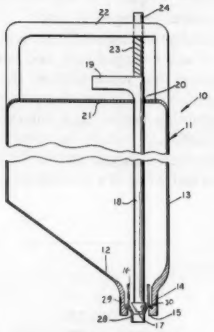
discharge passage is prevented with said plunger head in said depressed and locked position.

4,286,737

FERTILIZER DISPENSER WITH ONE-HANDED ACTUATION

Edward Gallant, R.D. #2, Cambridge Springs, Pa. 16403

Filed Feb. 22, 1980, Ser. No. 123,497
Int. Cl.³ B65D *23/10, 25/48, 83/06*
U.S. Cl. 222—470 **1 Claim**



1. A dispenser comprising a tank having a bottom, a top and sides,

said bottom sloping toward one of said sides and a hollow cylindrical nipple attached to said bottom forming an opening in said bottom,

said hollow nipple having inwardly extending shoulders,

a hollow insert having an outwardly directed flange resting on said shoulders,

spaced first rods attached to said flange and extending upwardly therefrom,

a valve disposed between said first rods and adapted to seat on said insert member,

a second rod attached to said valve and extending upwardly therefrom,

a handle on the upper end of said second rod,

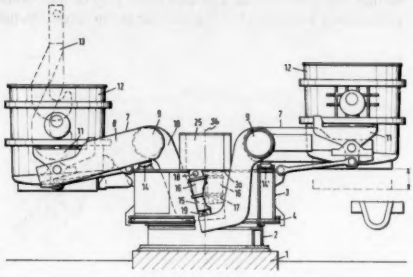
said tank having a second handle disposed generally perpendicuar to said rods said second handle being attached to said tank and a compression spring between said handles urging said valve into engagement with said insert member, said first handle being adapted to be moved toward said second handle for lifting said valve away from said insert to dispense material from said tank.

4,286,738

REVOLVING TOWER SUPPORT FOR CASTING LADLES

Wilhelm Blum, Junkerath, Fed. Rep. of Germany, assignor to DeMag Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

Filed Feb. 19, 1980, Ser. No. 122,453
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1979, 2916042
Int. Cl.³ B22D *41/00*
U.S. Cl. 222—591 **10 Claims**



1. A rotatable support for casting ladles comprising

(a) a base;

(b) a support rotatable on said base;

(c) a pair of oppositely extending support levers mounted for vertical articulation on said support;

(d) a casting ladle receiver mounted in the end of each support lever opposite said rotatable support;

(e) a cross beam forming the inner end of each said support lever;

(f) a power arm fixed on each cross beam;

(g) power means extending between said rotatable support and each said power arm; the improvement characterized by

(h) each said support lever includes a pair of spaced arms extending from their respective cross beam;

(i) bearing means on said rotatable support for the vertical articulation of each of said support levers;

(j) each bearing means being open topped; and

(k) said rotatable support is annular.

4,286,739

CONVERTIBLE BACK PACK FRAME

Philip B. Silcott, McLean, Va., and James H. Stubbings, Rockville, Md., assignors to Potomac Applied Mechanics, Bethesda, Md.

Filed Jul. 6, 1979, Ser. No. 55,369
Int. Cl.³ A45F *4/00*
U.S. Cl. 224—156 **26 Claims**

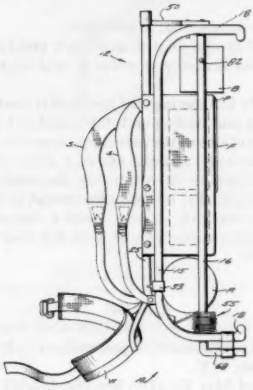
1. A back pack frame comprising

(a) a main support structure including a pair of side supports, and a pair of cross-supports extending between said side supports; each said side support including (i) first and (ii) second side support bars, said second bar being substantially straight, and said first bar being straight and substantially parallel to said second bar over the majority of the length thereof, (iii) a pair of interconnecting bars rigidly interconnecting said first and second side support bars and fixing the relationship therebetween, and (iv) a pair of legs extending from said second bar away from said first bar, said legs and interconnecting bars being in fixed position

relative to each other disposed in a common plane with said first and second bars; and

(b) a pack supporting structure including shoulder straps for mounting said frame on a person's shoulders; and

(c) means for mounting said pack supporting structure with respect to said main support structure so that said pack



supporting structure is always laterally within said side supports of said main support structure, and so that it is movable from a first position wherein it is generally within the volume defined by said main support structure, to a second position wherein it is primarily without the volume defined by said main support structure, while still connected thereto.

4,286,740

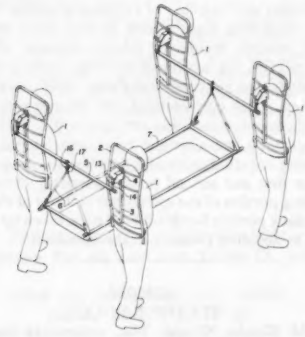
APPARATUS FOR ATTACHING A LOAD TO TWO OR MORE BACKPACK FRAMES

William E. Knight, 5000 Park Pl., Bethesda, Md. 20016

Filed Jan. 14, 1980, Ser. No. 111,682

Int. Cl.³ A45F *3/10*; A61G *1/00*

U.S. Cl. 224—157 **2 Claims**



1. For use in the transportation of a load by at least two human bearers wearing backpack frames, each of which backpack frames has at least one rigid support member, an adapter comprising a central body portion and means for releasably connecting and positively securing said central body portion to at least one rigid support member of a backpack frame for a human bearer and further comprising docking means to which may be releasably connected a carrying pole for the transportation of a load, whereby the two said human bearers wearing said backpack frames with said adapters attached, and with the adapters further releasably attached to the two opposite ends of said carrying pole, may cooperate in the transportation of a load attached to said carrying pole.

4,286,741

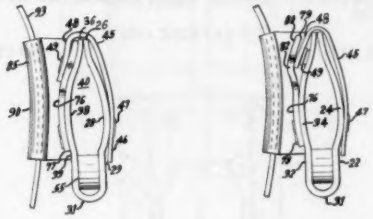
HANDGUN HOLSTER

William H. Rogers, Jacksonville, Fla., assignor to Alpha Plastics, Inc., Jacksonville, Fla.

Filed Oct. 25, 1978, Ser. No. 954,351

Int. Cl.³ F41B *13/04*

U.S. Cl. 224—193 **12 Claims**



1. In a handgun holster comprising a body including spaced outer and inner sidewalls having outer surfaces and defining an opening therebetween, an elongated element spanning said opening and including one end portion connected to said outer sidewall and a second end portion, a pair of cooperating snap elements, one of said snap elements being attached to said inner sidewall and the other of said snap elements being carried by said second end portion, and operating means movably mounted to said inner sidewall comprising a manually engageable flap projecting upwardly from said inner sidewall and a finger portion integral with said flap, said flap having a passageway therethrough with said passageway being capable of surrounding said engaged snap elements, said finger portion being disposed adjacent said one snap element and between said outer surface of said inner sidewall and said elongated element when said snap elements are engaged, said finger portion when so disposed may be engaged to move inwardly toward the wearer of the holster and cause said snap elements to become disengaged thereby releasing said elongated element whereby a handgun in the holster may be withdrawn through said opening.

4,286,742

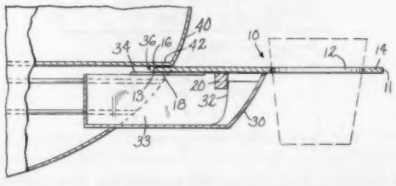
CUP HOLDER

Bernard Pellegrino, 100 Adia Dr., Hamden, Conn. 06514

Filed Feb. 29, 1980, Ser. No. 125,914

Int. Cl.³ A47G *29/00*

U.S. Cl. 224—281 **15 Claims**



1. A cup holder adapted to be attached at an ashtray of an automobile comprising:

(a) a plate having front and rear edges, two opposing sides, and a top and bottom surface;

(b) a cup receiving means located between the sides; and

(c) a stop having two opposing ends and extending from at least one surface and being substantially parallel to at least one of said edges, said stop adapted to be positioned against an interior portion of the automobile ashtray.

4,286,743

METHOD OF SOLDERING A FIRST VITREOUS COMPONENT TO A SECOND COMPONENT

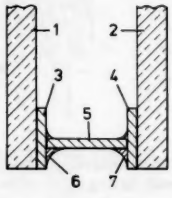
Jean-Pierre Vasseur, Brussels; Michel Laurent, Nivelles; Jean-Joseph Loriau, Fleurus, and Andre Delhaute, Chatelineau, all of Belgium, assignors to BFG Glassgroup, Paris, France

Filed Oct. 17, 1978, Ser. No. 952,129

Claims priority, application United Kingdom, Oct. 25, 1977, 44347/77

Int. Cl.³ B23K *1/08*

U.S. Cl. 228—124 **22 Claims**



1. A method of manufacturing a panel unit comprising the steps of assembling a first, vitreous sheet, and at least one other sheet held in spaced relation by at least one elongated metallic spacer intervening between metallic or metallised portions of each successive pair of sheets thereby forming an elongated joint region between each sheet and said spacer, said spacer comprising a web having a width greater than its thickness, said width of the spacer web governing the extent of sheet separation, and then dipping the elongated joint regions of the thus obtained assembly in a bath of molten solder.

4,286,744

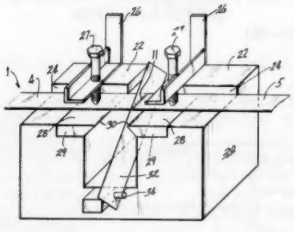
PROCESS FOR JOINING NARROW WIDTH THIN GAGE METAL OR ALLOY STRIP

Damian V. Gullotti, Cheshire; Lloyd E. Damon, Wallingford; Phillip A. Chatfield, West Haven, and Joseph Winter, New Haven, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Nov. 21, 1979, Ser. No. 96,464

Int. Cl.³ B21D *31/02;* **B23K** *1/04*

U.S. Cl. 228—125 **7 Claims**



1. A process for joining the trailing end of a first narrow width thin gage metal or alloy strip segment to the leading end of a second narrow width thin gage metal or alloy strip segment, said first and second strip segments being of approximately the same gage, and being of a width of about 3 in. or less and a gage of about 0.012 in. or less, comprising:

cutting off at least a portion of said leading and trailing ends to produce a trailing edge on said first strip segment and a leading edge on said second strip segment;

aligning said first and second strip segments so that said leading and trailing edges and at least a portion of said leading and trailing ends adjacent said leading and trailing edges are in a single plane, said leading and trailing edges matching in abutting relation and defining a joint therebetween;

applying a braze material to said joint;

applying heat to said joint so as to melt said braze material and join said first strip segment to said second strip segment; and

simultaneously hammering said joint and at least a portion of said leading and trailing ends for a time and at a pressure such that portions of the parent metal or alloy of said first and second strip segments act as a shim; whereby said joint is reduced to approximately the same geometrical cross section as that of the parent metal or alloy of said first and second strip segments with a minimum of metal flow and deformation at said joint and said leading and trailing ends.

4,286,745

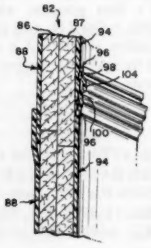
CONTAINER FOR BEVERAGES AND THE LIKE

Kazuaki Fukuoka, Yokohama, Japan, assignor to Norton Simon, Inc., New York, N.Y.

Filed May 23, 1979, Ser. No. 111,464

Int. Cl.³ B65D *3/14, 3/22, 3/28*

U.S. Cl. 229—4.5 **7 Claims**



1. A tubular wall member of a tubular container for flowable materials including liquids such as fruit juice and the like, having a bonded multilayer tubular element comprising a plurality of plies, the innermost ply being formed of a helically wound elongated polymer-containing sheet material having overlapping spiral convolutions, the overlapping portion of said spiral convolutions being provided with a continuous first bond therealong and a second bond adjacent said first bond and defining together with said first bond a slack portion between the first and second bonds extending along the inner overlapping portion of the spiral convolutions of the innermost ply, said slack portion being adapted to be taken up inwardly in response to negative pressure in the container.

4,286,746

FLEXIBLE POUCH

Thomas M. Gorshe, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

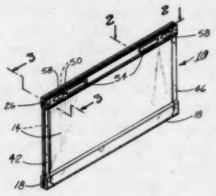
Filed Jan. 14, 1980, Ser. No. 111,922

Int. Cl.³ B65D *33/02*

U.S. Cl. 229—55 **9 Claims**

1. A substantially flat pouch made with flexible sheet material, and susceptible of being opened into a receptacle, said pouch comprising: a pair of opposed side wall panels joined to each other about the periphery thereof, and having a pair of opposed unjoined margins along one edge of the periphery, the combination of said joined side wall panels and said unjoined margins forming a receptacle capable of receiving and holding

product; said margins having predetermined locations thereon for the forming of sharp corners when the pouch is opened, and said margins having reinforcement thereof adjacent each



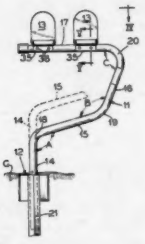
said predetermined location, whereby said margins are stiffened and rendered more resistant to flexing in said reinforced areas relative to said predetermined locations.

4,286,747

MAIL BOX SUPPORT

Robert F. Deike, Cheyenne, Wyo., assignor to Foresight Industries, Cheyenne, Wyo.

Filed Jan. 17, 1980, Ser. No. 113,025
Int. Cl.³ B65D *91/00*
U.S. Cl. 232—39 **12 Claims**



1. A support for mailboxes and the like devices mounted alongside roadways which protects the occupants of a vehicle crashing into the support which comprises a post having a depending upright leg adapted to be anchored in the ground, a generally horizontal upright sloping leg extending laterally from the top of said upright leg, an outwardly sloping substantially vertical leg extending upwardly from the upper end of said lateral leg and a top horizontal leg extending rearwardly from the top of the sloping vertical leg overlying the lateral leg in spaced superimposed relation, and a ground anchor seating the lower end of the depending upright leg and securing the support in an upright position with the sloping legs parallel to the roadway and facing oncoming traffic on the roadway.

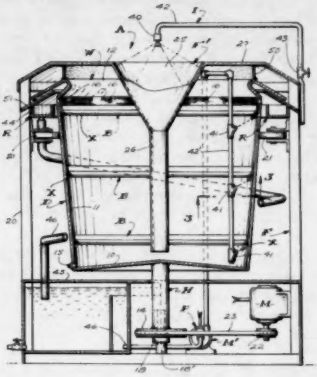
4,286,748

CENTRIFUGAL CONCENTRATOR

Albert C. Bailey, Box 65, Lolo Park Trailer Ct., Lolo, Mont. 59847

Filed May 19, 1980, Ser. No. 150,895
Int. Cl.³ B04B *15/12, 11/00*
U.S. Cl. 233—1 D **6 Claims**

1. A concentrator comprising an elongate vertical upwardly opening drum with an upwardly and radially outwardly inclined side wall and a substantially horizontal bottom wall, means rotatably supporting the drum on a vertical axis, drive means rotating the drum about said axis, a plurality of vertically spaced annular radially inwardly and downwardly inclined baffles at the inside surface of the side wall and cooperating therewith to define a plurality of vertically spaced annular substantially downwardly opening heavy material collecting recesses, a normally closed drain opening at the lower end of the drum, material supply means to deliver particulate material into the drum adjacent the bottom wall and including a vertical material conductor with open upper and lower ends; and irrigating means including a water supply communicating with the upper end of said conductor and delivering water into



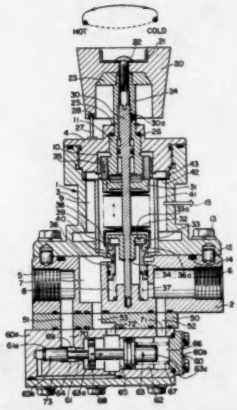
and through the conductor and vertically spaced nozzles connected with the water supply and arranged within the drum and directing streams of water toward the inside surface of the side wall and onto and through particulate materials at said surface of the side wall.

4,286,749

AUTOMATIC FLUID MIXING VALVES

Tomio Oguma, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 27, 1979, Ser. No. 61,414
Claims priority, application Japan, Jul. 28, 1978, 53/93023
Int. Cl.³ G05D *23/00, 11/00*
U.S. Cl. 236—12 A **4 Claims**



1. An automatic fluid mixing valve comprising: a valve body including a chamber therein for mixing high and low temperature fluids, said chamber including first and second gates; temperature sensing means housed in said chamber and responsive to the temperature of the mixed fluid in said chamber for adjusting the openings of said first and second gates; first passage means in said body for communicating a source of low temperature fluid through said first gate into said chamber; second passage means for communicating a source of high

temperature fluid through said second gate into said chamber; and pressure control means for automatically adjusting only the pressure of the low temperature fluid flowing into said chamber in response to a change in the pressure of one of the high temperature and low temperature fluids flowing into said chamber, said pressure control means communicating with said second passage means for maintaining the pressure ratio of the low temperature fluid to the high temperature fluid at a substantially constant level, said body including a valve bore having a port at one end thereof, and said pressure control means including piston means slidably mounted in said bore and having opposed ends, said piston means defining a first cavity in fluid communication with said source of low temperature fluid through said port, a second cavity in fluid communication with said first passage means and said first cavity, and a third cavity for receiving high temperature fluid from said source of high temperature fluid, said pressure control means also including a spring disposed in said bore for biasing said piston means in one direction for enlarging the opening of said port, and a bypass passage for communicating between said second cavity and one end of said piston means for urging said piston means in the other direction against the bias of said spring.

4,286,750

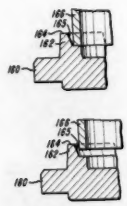
THERMOSTATIC VALVE DEVICE HAVING NON-LINEAR FLOW CHARACTERISTICS

Backman Wong, Wayland, and Earl L. Wilson, Wellesley, both of Mass., assignors to Standard-Thomson Corporation, Waltham, Mass.

Continuation of Ser. No. 22,432, Mar. 21, 1979, abandoned, which is a division of Ser. No. 835,652, Sep. 22, 1977, Pat. No. 4,164,322, which is a division of Ser. No. 587,915, Jun. 18, 1975, Pat. No. 4,053,105, which is a continuation-in-part of Ser. No. 384,519, Aug. 1, 1973, Pat. No. 3,893,618. This application Jun. 16, 1980, Ser. No. 160,063

Int. Cl.³ G05D *23/12*

U.S. Cl. 236—34.5 **3 Claims**



1. A thermally responsive fluid control valve device for the cooling system of an internal combustion engine for elimination of temperature fluctuations in the fluid during initial opening operation of the valve device, comprising:

a stationary valve member including an annular valve seat portion defining a fluid port having an upstream side and a downstream side, the annular valve seat portion forming a flat annular valve seat extending radially at right angles to the direction of fluid flow through the fluid port,

a movable valve member having a closure portion normally in engagement with the valve seat, the movable valve member having a cylindrical outer surface and being movable from the valve seat in a downstream direction,

the stationary valve member including an annular wall extending from the valve seat portion on the downstream side and surrounding the cylindrical outer surface on the closure portion of the movable valve member when the closure portion is in engagement with the flat annular valve seat, the annular wall having an inner surface which slopes outwardly from the flat annular valve seat and the cylindrical outer surface in the downstream direction,

thermally responsive actuator means supported by said stationary valve member, and

means connecting the thermally responsive actuator means to the movable valve member for movement thereof with respect to the stationary valve member,

the closure portion of the movable valve member being movable axially beyond the confines of the annular wall, initial movement of the movable valve member from the flat annular valve seat providing for non-linear fluid flow between the outer cylindrical surface of the movable valve member and the inner surface of the annular wall to provide smooth non-fluctuating operation of the actuator means during initial opening of the movable valve member until the movable valve member moves axially from the confines of the annular wall, and further movement of the movable valve member beyond the confines of the annular wall providing for a linear fluid flow.

4,286,751

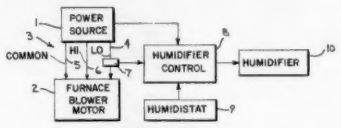
HUMIDIFIER CONTROL

Thomas P. Fowler, Madison, Wis., assignor to Research Products Corp., Madison, Wis.

Filed Mar. 19, 1979, Ser. No. 21,719

Int. Cl.³ B01F *3/02*; H02H *3/00*

U.S. Cl. 236—44 R **10 Claims**



1. A control for a humidifier connected to an air movement system operatively receiving electrical energy through an energy conducting circuit for conducting air to a designated area and controlling the moisture in said conducted air, said control comprising energy sensor means including a closed loop flux conducting circuit having a portion selectively movably between a first position establishing said closed loop flux conducting circuit and a second position establishing an open loop for permitting said sensor means to be removably connected to surround in electrical isolation at least one lead of said energy conducting circuit and generating a magnetic flux signal in response to the energy flow through said connecting circuit and providing an output signal occurring at a first time substantially at the start of energy flow through said energy conducting circuit, and time delay means having an input connected to operatively respond to said energy flow indicative output signal and an output connected to operatively energize said humidifier for operation at a second time following said first time by a predetermined time delay in response to said energy flow indicative output signal.

4,286,752

NESTING TRACK SECTION FOR MODEL VEHICLES

Richard C. M. Cheng, 1001 Genter St., La Jolla, Calif. 92037

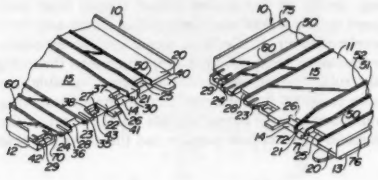
Continuation of Ser. No. 857,503, Dec. 5, 1977, Pat. No. 4,231,517. This application Nov. 27, 1979, Ser. No. 97,654

Int. Cl.³ E01B *23/00*; A63H *19/28*

U.S. Cl. 238—10 F **1 Claim**

1. A track section for model vehicles, said track section comprising a generally flat bed having end edges and an upper generally horizontal working surface bounded within a pair of spaced generally vertical side edges, a plurality of spaced projections on each end edge, said projections combining to define recesses in the spaces between said projections, said projections and recesses being configured for interdigitation upon end to end aligned engagement with a like track section, and a vertically upstanding wall of generally rectangular cross-

section on each side edge of said bed and having its lower edge spaced above the underside of said bed to define a rectangular recess between the lower edge of each upstanding wall and the adjacent side edge of said bed, each of said recesses having a rectangular cross-sectional configuration substantially identical to the rectangular cross-sectional configuration of a respective upstanding wall above said working surface, said upstanding walls each having its upper edge spaced above said working surface a distance approximately equal to the distance the lower edge of each upstanding wall is spaced above the underside of said bed, for nesting superposed engagement with a like track section with the upstanding walls of the lower section closely and conformably entering said recesses of the upper section and the working surface of the lower section substantially engaging the underside of the upper section to define a substantially solid stack of nested sections, said stack having vertical sides defined by the outer sides of said walls for conforming side engagement of stacks in side by side relation for maximum economy of space and minimum relative shifting in storage.



4,286,753

COMBINATION WOOD PLASTIC RAILROAD TIE

Hong Man Lee, White Plains, N.Y., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 516,586, Oct. 21, 1974, abandoned.
This application Feb. 25, 1976, Ser. No. 661,267
Int. Cl.[3] E01B 3/10
U.S. Cl. 238—37 **5 Claims**

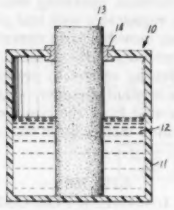
1. A railroad tie for supporting railroad track rails on a ballast or concrete roadbed comprising: a main body portion of natural wood made up of two or more wood sections of rectangular cross section, each as wide as the tie, having a rectangular cross section of sufficient size to grippingly receive a rail spike; a plurality of preformed flat plies positioned on and coextensive with the broader surfaces of said body portion in compressive strength reinforcing relationship therewith, each of said plies including a mass of shredded wood fibers or wood chips bound together to form a dense homogeneous mass by a cured thermal setting resin; a further plurality of said preformed flat plies positioned between said wood sections; and bonding means joining the plies to said surface of the main body portion to form a unitary railroad tie structure with sufficient compressive strength to operatively support rails mounted thereon with enhanced surface wear resistance from the protection of said plies overlying the broader surface of said main body portion, said bonding means consisting essentially of a layer of cured thermal setting resin between each of said components for high rail retention strength while imparting resistance against cracking of the main body portion when a rail spike is applied.

4,286,754

CONTROLLED-RATE LIQUID DISPENSER

Cheryl D. Jones, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 10, 1976, Ser. No. 685,116
Int. Cl.[3] A61L 9/00
U.S. Cl. 239—6 **14 Claims**



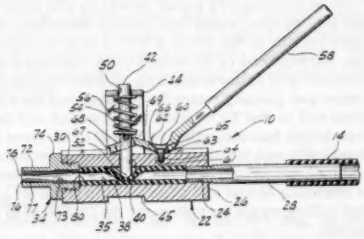
1. A method for dispensing liquid comprising wicking said liquid into a wicking structure that comprises a matrix of closely packed, solid, rounded particles adhered together so as to leave an interconnected network of pores that occupies at least 20 volume-percent of the porous structure; the average diameter of said particles in the wicking structure being between 150 and 600 micrometers, and all said particles in the wicking structure having a diameter within plus-or-minus 20 percent of the average diameter of the particles, whereby the pores in the porous structure are uniform in size and the liquid is released from the porous structure at a uniform rate over an extended period of use; and exposing said wicking structure in the environment where it is desired to give off said liquid.

4,286,755

VALVE FOR A SANDBLASTING DEVICE

Ronald L. Shipman, Cape Girardeau County, Mo., assignor to Lenco, Inc., Jackson, Mo.

Filed Oct. 15, 1979, Ser. No. 84,732
Int. Cl.[3] B05B 9/08
U.S. Cl. 239—530 **16 Claims**



1. A valve for use on a blasting and like device comprising a housing structure having first and second end portions and a passageway extending therebetween, said housing structure having an opening therethrough intersecting said passageway at an intermediate location therealong, means associated with the first end portion for operatively attaching said housing structure to a source of blasting material, a nozzle guard assembly having means associated therewith for cooperatively engaging the second housing structure end portion, said nozzle guard assembly having a passageway therethrough which communicates with the passageway in the housing structure, a nozzle element removably insertable in the passageway in the guard assembly communicating with the passageway in said housing structure through which and from which a blasting material can be expelled, an open ended flexible conduit mem-

ber positioned in the passageway in said housing structure and extending therein between said first and second end portions, means mounted on said housing structure for controlling the flow through said flexible conduit member, said last named means including plunger means extending through said housing opening into engagement with said flexible conduit member at an intermediate location therealong, means biasing said plunger means against said flexible conduit member to maintain it in a closed condition, operating means on the housing structure operatively engageable with said plunger means, said operating means being movable to an operating position moving the plunger means outwardly in the housing opening in opposition to said biasing means to permit communication through the flexible conduit member, said flexible conduit member being removable from the passageway for replacement when the operating means are in the operative position.

4,286,756

CONTINUOUS UNCOILER FOR COILS OF WEB LENGTHS

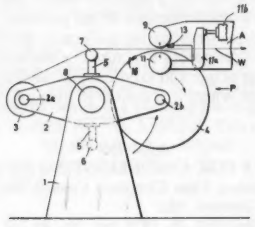
Hilmar Vits, Leichlingen, Fed. Rep. of Germany, assignor to Vits Maschinenbau GmbH, Langenfeld, Fed. Rep. of Germany

Filed Mar. 20, 1980, Ser. No. 132,106

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1979, 2911268

Int. Cl.[3] **B65H** *19/18*

U.S. Cl. 242—58.1 **5 Claims**



1. A continuous uncoiler for coils of web lengths and comprising means for rotatively mounting a first coil so its web length can be continuously pulled forwardly and form a continuously feeding span, means for rotatively mounting a second coil axially parallel to the first coil and so as to be opposite to said span, the front end of the second coil's web length having a transverse strip of adhesive and a rip cord behind and parallel to this strip, and pressing means for pressing said span against the second roll so that by rotation of the second coil the first coil's web length becomes adhesively fixed to the front end of the second coil's web length and pulls this front end forwardly with said trailing end overlapping said front end and having a portion extending behind said adhesive strip and over said rip cord, and pulling means for pulling the rip cord so as to rip off said portion.

4,286,757

METHOD AND APPARATUS FOR CONTROLLING THE BRAKING SYSTEM FOR AN UNWINDER

Hans Wirth, Baldwinsville, N.Y., assignor to The Black Clawson Company, Fulton, N.Y.

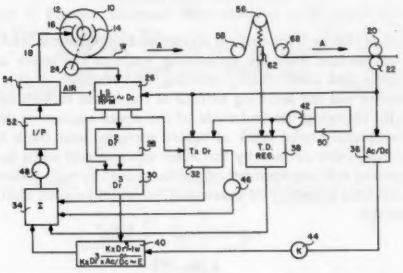
Filed Apr. 3, 1980, Ser. No. 137,041

Int. Cl.[3] **B65H** *25/22*

U.S. Cl. 242—75.44 **5 Claims**

1. In an apparatus for controlling a braking action of a roll of web material supported for rotation on an unwinding device including:

means for continuously measuring line speed and rate of change thereof of said web downstream of said unwinding device and providing an output signal proportional to said line speed, means for continuously measuring rotational speed of said roll of web and providing an output signal proportional to said rotational speed, means receiving said output signals from said line speed and rotational speed measuring means and combining said signals to produce an output signal proportional to the diameter of said roll, means receiving said output signal proportional to said roll diameter and producing an output signal proportional to a predetermined desired web tension downstream of said roll, means receiving said output signal proportional to said line speed and producing an output signal proportional to the acceleration or deceleration of said roll, if any, means receiving said output signals from said line speed and rotational speed measuring means and from said acceleration or deceleration signal producing means and producing an output signal proportional to the energy in said roll, braking means for applying variable braking force to said roll, and brake control means receiving and combining of said output signals proportional to the roll diameter, desired web tension and the energy in said roll



and producing an output signal to said braking means for causing said braking means to apply variable braking force to said roll substantially maintaining said predetermined tension in said web as it is being unwound during acceleration, deceleration and constant web speed conditions,

wherein the improvement comprises:

said means for producing an output signal proportional to the energy in said roll includes, means receiving said output signal proportional to the diameter of said roll and producing an output signal proportional to the cube of the diameter of said roll;

means receiving said output signal proportional to the cube of the diameter and said output signal proportional to said acceleration or deceleration of said roll, if any, and for combining said signals proportional to the cube of the diameter and the acceleration or deceleration of said roll to produce an output signal proportional to the energy in said roll, said last named means including means for manual adjustment to modify said output signal thereof to correspond to the density and width of said roll.

4,286,758

WEBBING RETRACTOR

Mitsuo Inukai, and Hajime Kamiyama, both of Nagoya, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 29, 1980, Ser. No. 116,495

Int. Cl.[3] **A62B** *35/02;* **B65H** *75/48*

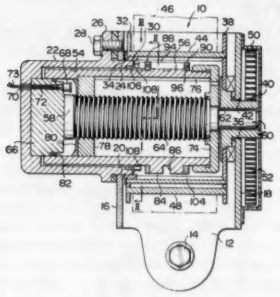
U.S. Cl. 242—107 **10 Claims**

1. A webbing retractor for use in a seatbelt system for retaining and protecting an occupant in an emergency of a vehicle, comprising:

(a) a winding barrel for winding up a webbing for restraining the occupant;

(b) an internal gear ratchet wheel provided on said winding barrel;

(c) a drum journalled coaxially with said winding barrel;
(d) a pawl provided on the outer periphery of said drum;
(e) cam means coupled to a frame and provided adjacent said pawl for moving said pawl in the radial direction of the winding barrel when said pawl is rotated with said drum and for causing said pawl to be meshed with said internal gear ratchet wheel; and



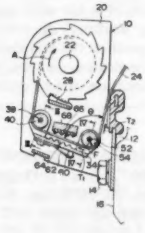
(f) drive means for rotating said drum in the direction of winding up the webbing in an emergency of the vehicle; whereby said drum is adapted to drive the winding barrel to forcedly wind up one end of the webbing around the winding barrel, to thereby closely attach the webbing to the occupant.

4,286,759

WEBBING LOCK MECHANISM

Susumu Usami; Yoshihiro Hayashi; Junichi Nakaho, and Jun Yasumatsu, all of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Tokai Rika Denki Seisakusho, both of Aichi, Japan

Filed Dec. 11, 1979, Ser. No. 102,407
Claims priority, application Japan, Jan. 8, 1979, 54-1525[U]
Int. Cl.[3] A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107.2 **8 Claims**



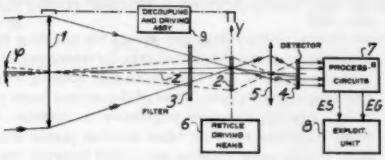
1. A webbing lock mechanism used in a seatbelt system for locking an occupant restraining webbing to restrain an occupant in an emergency of the vehicle such as a collision, comprising:
(a) a frame secured to the vehicle body;
(b) a lock lever pivotally supported by said frame for pivoting in an emergency of the vehicle;
(c) a roller rotatably supported by said lock lever, around which an intermediate portion of said webbing is guided, said roller being provided with a emergency contact portion for coming into contact with said lock lever to receive resistance in an emergency of the vehicle; and
(d) lock members for clamping the intermediate portion of said webbing to lock same when said lock lever pivots in an emergency of the vehicle thereby restraining the occupant having the webbing fastened thereto.

4,286,760

PHOTOELECTRIC DIRECTION FINDER

Georges Couderc; Yves Cojan, and Jean-Louis Beck, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 12, 1979, Ser. No. 19,697
Claims priority, application France, Mar. 14, 1978, 78 07276
Int. Cl.[3] F41G *7/00*
U.S. Cl. 244—3.16 **17 Claims**



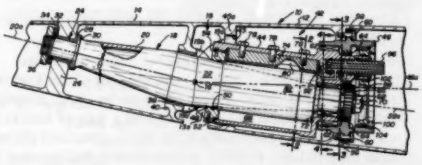
1. A photoelectric direction finder for detection and angular location of a light-radiating target, comprising:
optical reception means for focusing radiation coming from an observed field;
optical filtering means for selection of the radiation received from said target;
reticle means in the form of a revolving disc centered on the optical axis of said optical reception means and having a reticle pattern on one planar surface thereof for modulating and spatial filtering of the focused radiation, the reticle pattern being located substantially in the focal plane of the optical reception means and comprising at least one optical circular track formed of a uniform array of alternate opaque and transparent radially extending sectors to modulate said radiation at a determined modulation frequency;
detection means comprising a four quadrant detector at a distance from said reticle means, and an intermediate optical objective for transposing the focused field image on said detector;
means for relative movement of the assembly comprising said optical reception means and said reticle means with respect to said detection means, by rotation around an instantaneous center of rotation which coincides substantially with the center of said detector; and
circuits for processing and deviation measurement of four reception channels issued from said detection quadrants respectively, to demodulate the signals detected and produce deviation signals representing the angular offset of the target direction with respect to a reference measurement axis.

4,286,761

ECCENTRIC ACTUATOR

Robert G. Musgrove, Arlington, Tex., assignor to Vought Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 933,697, Aug. 15, 1978, abandoned. This application Nov. 9, 1979, Ser. No. 92,970
Int. Cl.[3] B64C *13/28;* F16H *33/10*
U.S. Cl. 244—75 R **43 Claims**



1. An actuator for effecting relative movement between two structures about a pivot axis, comprising:
an elongate beam with first and second portions having first

and second longitudinal axes, respectively, said axes intersecting at the pivot axis and being mutually skewed at a predetermined skew angle;

said beam being secured at the first portion to the first structure for rotation about the first axis;

housing means attached to the second structure for supporting the second beam portion for rotation about the second axis and for eccentric revolution about a circle with a centerline intersecting the pivot axis;

means for effecting rotation of said beam about the second axis; and

index means, distinct from said means for effecting rotation of said beam about the second axis, for interconnecting the second portion of said beam with said housing means for effecting eccentric revolution of the second beam portion in an opposite direction responsive to rotation of said beam such that the first beam portion pivots about the pivot axis to cause relative movement between the structures.

37. In combination with an airfoil of the variable camber type having first and second relatively pivotal segments, an improved actuator for effecting relative movement about a pivot axis, which comprises:

an elongate beam with first and second beam portions each having a longitudinal axis, said axes being mutually skewed at a predetermined acute skew angle and intersecting the pivot axis;

said first beam portion being secured to the first segment for rotation about the axis of the first beam portion;

housing means for rotatably securing the second beam portion to the second segment;

said housing means including a support member affixed to the second segment and a carrier member secured at one end to the support member for rotation relative thereto about an axis extending through the pivot axis, with said second beam portion being rotatably secured to the carrier member at an angle approximately equal to the skew angle so that the second beam portion is mounted for eccentric revolution;

means disposed within said housing means for effecting rotation of the beam about the axis of the second beam portion; and

index means interconnecting the second beam portion with the support member of said housing means for effecting rotation of the carrier member in an opposite direction and at substantially the same rate as the rate of rotation effected in the beam so that one portion of the beam is pivoted about the pivot axis to effect relative pivotal movement between the first and second segments of the airfoil.

4,286,762

KITE-LIKE FLYING DEVICE AND ACCESSORIES THEREOF

Jonathan J. Prouty, P.O. Box 3065, Boulder, Colo. 80307

Filed Apr. 27, 1979, Ser. No. 34,032
Int. Cl.³ B64C *31/06*
U.S. Cl. 244—153 R **15 Claims**

1. A kite-like flying device including,

a sail of flexible sheet material,

a keel stick for stiffening the longitudinal centerline of the sail,

wing sticks for stiffening the leading edges of the sail,

a connector for connecting the leading end of the keel stick to the leading ends of the wing sticks, said connector including a longitudinal element and a pair of lateral elements extending outwardly from the longitudinal element, said longitudinal element telescopically fitting over the leading end of the keel stick, said lateral elements being flexible tubular elements located rearwardly of the leading end of the longitudinal element whereby the longitudinal element will receive and absorb the impact in the event of collision, said lateral elements being connected to the leading ends of the wing sticks,

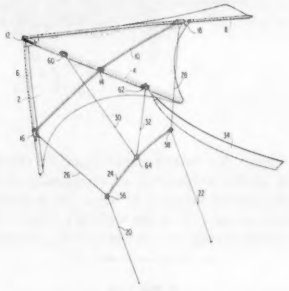
wing connectors slidably mounted on said wing sticks so as to move during flight of the device, said wing connectors having bores which are slightly inclined relative to each other,

a cross stick having its ends located in said bores, said cross stick being resiliently flexed to establish firm frictional engagement of the cross stick within said bores,

a control rod,

a first set of control strings connecting the control rod to the sail, and a second set of strings extending from the control rod to the operator of the device,

said first set of strings including strings connected to the wing connectors so the location of the wing connectors and cross stick will move in response to changes in the



control strings to change the shape and rigidity of the device,

at least one of said strings being connected to the control rod by a connector which has a set of at least three generally parallel bores, said string extending back and forth through said bores to form exposed loops, a portion of said string extending through one of said loops to prevent longitudinal movement of the string relative to the control rod when the string is under tension,

a tail connected to the sail, means for disconnecting one of the strings from the sail when the tail is pulled,

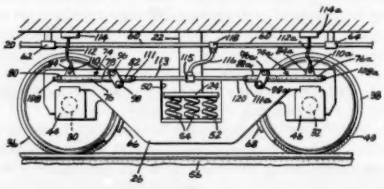
a template provided in a kit with said flying device, said template having markings thereon alignable with the flying device to position the template at a given longitudinal position on the device, and means on the template for designating the location of said control rod.

4,286,763

DERAILMENT EMERGENCY VALVE

Harold E. Hayden, Rte. 2, Box 58, Delphi, Ind. 46923

Filed Jun. 25, 1979, Ser. No. 51,369
Int. Cl.³ B60T *7/12*
U.S. Cl. 246—172 **8 Claims**



1. Apparatus for emergency braking of a railway car which includes two parts, one part being an elongated wheel truck and the other part being a car frame, the wheel truck being

provided with at least one axle for rotatably supporting a train wheel and having a fluid pressurized brakeline in a wheel braking system, and the wheel truck resiliently supporting said car frame, the improvement comprising:

an elongated tubular break-away valve member;

means for connecting said member in fluid tight relation to said pressurized brake line whereby the fluid pressure is maintained in said line and in said member;

means for rigidly attaching said member at one point thereon to one of said parts, said member extending substantially horizontally on and having a portion extending beyond said point of attachment, a peripheral groove in said member adjacent to said point of attachment, a flexible, substantially inextensible cable having one end attached at a first connection point to said extended portion and the other end attached at a second connection point to the other of said parts; said cable being dimensioned so that during a predetermined separation of said car frame and truck tensional force is produced in said cable causing said valve member to break-away;

said first and second points being on a line substantially vertically and normal to the longitudinal axis of said member so that when said car frame and truck are in relatively separated positions corresponding to an emergency condition, said cable is tensioned and said force is exerted substantially normal to the longitudinal axis of said member to maximize the break-away force on said member at said groove thus providing fluid escape from said line when rupture occurs to reduce the pressure in said line sufficiently to actuate wheel braking during emergency conditions.

4,286,764

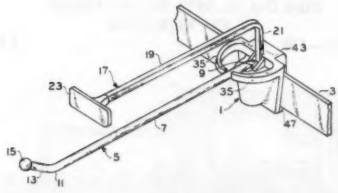
MERCHANDISE HANGER ASSEMBLY

William Pfeifer, 400 Elwyn Ave., Springdale, Pa. 15144

Filed Jul. 9, 1979, Ser. No. 55,828

Int. Cl.³ A47F *5/00*

U.S. Cl. 248—220.3 **8 Claims**



1. In combination, a hanger member comprising an elongated shank and a base portion of circular cross-section depending at substantially a right angle from one end of the shank, a tag support member comprising an elongated shaft having means at one end for displaying information related to merchandise to be hung from the hanger member and having a base portion of noncircular cross-section depending at substantially a right angle from the opposite end of the shaft, and a bracket comprising a body member having a planar rear surface and an upper surface, a first bore of circular cross-section extending vertically downward into said body member from said upper surface for receiving the base portion of said hanger member, resilient centering means integral with said body member bearing against the sides of the shank of the hanger member for returning the hanger member to a center position wherein the shank extends forward at substantially a right angle to the planar rear surface of the body member whenever displaced laterally therefrom, and a second bore having a noncircular cross-section corresponding to that of the base of the tag support member extending vertically downward into said body member from said upper surface between said first bore and said planar rear surface, said second bore being of such a depth that with the base of the tag support member inserted in the second bore, the shaft extends substantially parallel to and spaced above the shank of the hanger member.

4,286,765

VEHICLE SEATS

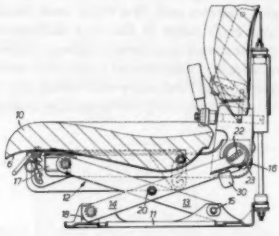
Jean Delgleize, Brussels, and Henri Deleenher, Soignies, both of Belgium, assignors to UOP Inc., Des Plaines, Ill.

Filed May 8, 1979, Ser. No. 37,184

Claims priority, application United Kingdom, May 10, 1978, 18630/78

Int. Cl.³ A47C *3/22*

U.S. Cl. 248—573 **6 Claims**



1. A vehicle seat comprising

a seat part,

a base part,

a suspension interconnecting the seat part and the base part and forming a guide for the upward and downward movement of the seat part relative to the base part,

a seat-supporting spring which acts upwardly on the seat part and, under static load conditions supports the seat part and the seat occupant at a ride position which is adjustable by varying the preload of the spring, the seat having elements which move relatively to one another during rise and fall of the seat part relative to the base part,

an up-stop device and an up-stop abutment mounted respectively on said relatively movable elements of the seat,

a support member fixed to one said element and on which the up-stop device is movably mounted, said up-stop device being movable relative to the support member to vary the up-stop position, namely, the height of the seat part at which further upward movement of the seat part is prevented by mutual engagement of the up-stop device and up-stop abutment, characterised by the improvement that

the up-stop device is compressible, against the force of a first return spring, through a distance corresponding to the distance between the ride position of the seat and the up-stop position, and the seat includes,

a normally engaged, but releasable, locking device for locking the up-stop device to said support member, and,

a second return spring which acts on the up-stop device and, upon release of the locking device, urges the up-stop device against the abutment device with a force substantially weaker than the force of the first return spring.

4,286,766

COLLAPSIBLE MOLD CORE

John W. von Holdt, 7430 N. Croname Rd., Niles, Ill. 60648

Filed Apr. 18, 1980, Ser. No. 141,399

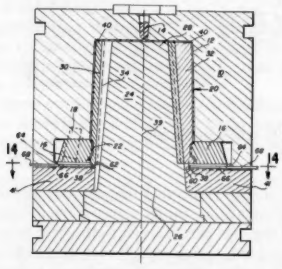
Int. Cl.³ B29C *7/00*

U.S. Cl. 249—144 **11 Claims**

1. A collapsible mold core having cylindrical outer walls in its molding configuration, which comprises:

an inner core member of the general shape of a truncated cone defining opposed first and second ends, said inner core member tapering transversely to a reduced diameter

from said first end to the second end, and a plurality of outer core members, attached to the lateral exterior of said inner core member in longitudinally slidable relation thereto between first and second positions, said outer core members defining first ends and second ends corresponding in position to the first and second ends of the inner core member, said outer core members tapering inwardly in transverse dimension from their second ends to their first ends, to provide an opposite taper to that of the inner core member, key and keyway means providing longitudinally sliding attachment between said inner core member and outer core members, said outer core members including first outer core members defining an arcuate outer surface and converging inner surfaces connected at their edges to lateral edges of the outer surface and defining acute angles thereto, said first outer core members being spaced from each other in the first sliding position and having an inner wall in intimate sliding contact with the inner core member, and second outer core members positioned between said first outer core members, said second outer core members being of generally triangular cross



section and defining a pair of inwardly-angled outer surfaces positioned in sliding relation with inner surfaces of adjacent first outer core members, said second outer core members each defining an arcuate, concave inner surface positioned in sliding relation with said inner core member, said inwardly-angled outer surfaces defining acute angles with the arcuate inner surface, said second outer core members each defining an outer arcuate apex surface positioned between outer edges of the inwardly angled outer surfaces and opposed to the arcuate inner surface, the arcuate outer surfaces of the first outer core members and the arcuate apex surfaces of the second outer core members defining, in the first sliding position, the outer side wall of said mold core, said mold core being substantially free of open interior spaces between said inner and outer core members in the first sliding position whereby said mold core is of lesser transverse diameter in said second sliding position than in the first sliding position, to permit molding of a cylindrical object about the mold core in the first sliding position, and removal of the object from the core in the second sliding position.

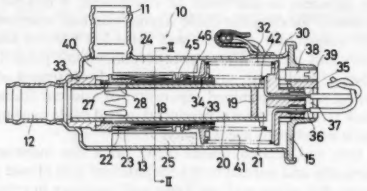
4,286,767

SOLENOID ACTUATED VALVE DEVICE

Kenji Hashimoto, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 18, 1979, Ser. No. 104,921
Claims priority, application Japan, Dec. 27, 1978, 53-162701
Int. Cl.[3] F16K *31/08*
U.S. Cl. 251—65 **3 Claims**

1. A solenoid actuated valve device for controlling the flow of fluid comprising a body having an inlet port and an outlet port extending therethrough, a hollow tubular core axially mounted within said body with one end thereof disposed in communication with said outlet port and having at least one radially extending aperture therethrough to provide communication between said inlet port and said outlet port, a bobbin slidably mounted on said core to control the effective open area of said aperture, a solenoid coil wound on said bobbin, permanent magnet means secured in said body so that the magnetic flux thereof intersects the windings of said solenoid coil at right angles thereto, cover means secured to said body in engagement with the other end of said core, said body, said cover member and said core being of magnetic material to define a magnetic circuit with said permanent magnet means to provide a magnetic force causing said bobbin to move relative to said core when an electric current is passed through said



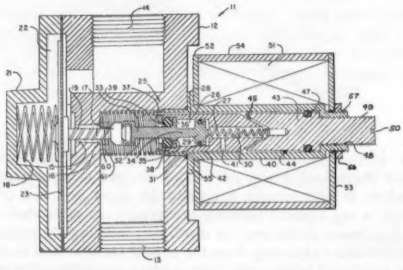
coil, spring means biasing said bobbin to a position closing said aperture, a first chamber located within said body at one end of said permanent magnet means in communication with said inlet port, a second chamber disposed within said housing at the opposite end of said permanent magnet means adjacent said cover means and passage means providing fluid communication between said first and second chambers; said permanent magnet means being comprised of two circumferentially spaced apart permanent magnets secured to said body radially outwardly of said coil with the circumferential spaces between said magnets defining said passage means.

4,286,768

STEPPED PRESSURE GAS VALVE APPARATUS

Frank Fiedler, Jr., Rowland Heights, Calif., assignor to Walter Kidde and Company, Inc., Clifton, N.J.

Filed Dec. 28, 1979, Ser. No. 108,165
Int. Cl.[3] F16K *31/02*
U.S. Cl. 251—130 **7 Claims**



1. A pressure responsive shut-off valve comprising:
a valve housing means defining a fluid inlet and a fluid outlet and a valve seat therebetween;
a valve closure means movable between a closed position against said valve seat and an open position away therefrom, said closure means preventing fluid flow between said inlet and outlet when in said closed position and permitting said fluid flow when in said open position;
a valve operator means comprising a pressure responsive piston movable between set and release positions, said operator means coupled to said valve closure means so as to effect location thereof in said open position with said piston in said set position and location thereof in said closed position with said piston in said release position;

a cylindrical magnetic plunger mounted for reciprocable movement in said housing means and retaining said piston, said plunger defining an activating volume communicating with said inlet and establishing an activating fluid pressure on one face of said piston, said activating fluid pressure forcing said piston toward said release position, said plunger further defining a reference volume communicating with said inlet and establishing a reference volume on the opposite face of said piston;

a bias spring member disposed in said activating volume and having one end coupled to said piston and an opposite end directly connected to said housing means, said spring member urging said valve operator means in a direction to produce movement of said valve closure means to said closed position;

a seal means for sealing said inlet from said reference volume with said piston in said set position and providing fluid communication therebetween with said piston in said release position;

latching means for latching said piston in said set position; and

manual reset means for moving said piston from said release position to said set position.

4,286,769

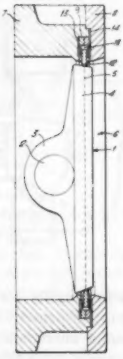
VALVE SEAT

Folke H. Hubertson, Säffle, Sweden, assignor to Aktiebolaget Somas Ventiler, Säffle, Sweden

Continuation-in-part of Ser. No. 76,847, Sep. 19, 1979, abandoned. This application Oct. 23, 1979, Ser. No. 87,527

Int. Cl.³ F16K *1/228*

U.S. Cl. 251—174 **9 Claims**



1. In a throttle valve comprising a valve housing having an annular recess therein, a throttle member pivotally movable in the valve housing and having an annular seal face throttle member seal face, the improvement comprising said valve seat including resilient means located in said annular recess and defining an annular groove, and a radially movable seat ring located in said annular groove, said seat ring being made of a stiff material but with sufficient radial direction resiliency such that when subject to a radial load from contact with the throttle member seal face said seat ring may be displaced and/or deformed in the radial direction, said resilient means and said seat ring cooperating so that when said ring moves in a radial direction under said radial load said resilient means sealingly engages said seat ring and when said radial load is removed from said seat ring said resilient means maintains said seat ring substantially in the displaced shape and position, so that wear between said seat ring and said seal face is minimized in that when said seat ring is circular and said seal face is circular, the seat ring is displaceable into alignment with said seal face and is maintained in the aligned position when said radial load is removed therefrom, and when said seat ring is circular and said seal face is elliptical, said seat ring is deformed into an elliptical shape and is maintained in said elliptical shape when said load is removed therefrom.

4,286,770

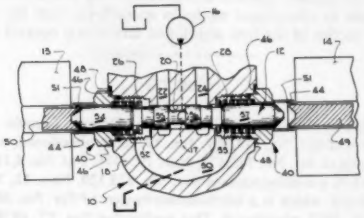
DEFORMABLE PLUG

Alan D. Jackson, Hutchinson, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Mar. 3, 1980, Ser. No. 126,609

Int. Cl.³ F16K *51/00*

U.S. Cl. 251—285 **11 Claims**



1. In a fluid control valve assembly including a valve element positioned in a bore in a valve body, the improvement comprising:

a plastically deformable plug means threadably received in said valve body for axial movement with respect to said bore;

stop means on the plug limiting axial movement of the valve element in said bore; and

a deformable contact area on said plug means which comes in contact with the valve body as the plug is moved axially in said bore, said area deforming within its plastic range while providing sufficient axial movement of the plug means to set the flow rates of the valve element.

4,286,771

HAULAGE APPARATUS FOR MINING MACHINES

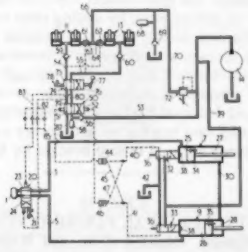
Miltiades Kormendy, Rolleston on Dove, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Sep. 7, 1978, Ser. No. 940,284

Claims priority, application United Kingdom, Sep. 13, 1977, 38071/77

Int. Cl.³ B66F *1/08*

U.S. Cl. 254—108 **11 Claims**



1. A mining machine comprising a body movable along a track extending along a desired machine path, two hydraulically actuated piston and cylinder arrangements each of which is attachable at one end to the machine body and each of which has at its other end means for attaching to hydraulically actuated track-engaging means for releasably engaging the track under action of a hydraulic ram, and control means for simulta-

neously actuating the two piston and cylinder arrangements in an opposite sense with respect to each other, the control means comprising detector means for detecting when at least one of the piston and cylinder arrangements is approaching the end of one stroke and having operational modes indicative of the detected condition of said at least one of the piston and cylinder arrangements, a directional control valve which in use has different operational modes for controlling the supply of pressure fluid to the hydraulic rams of the track-engaging means and which is actuated between its operational modes in accordance with the operational mode of said detector means, and a further directional control valve which in use has different operational modes for controlling the supply of pressure fluid to the piston and cylinder arrangements and which is actuated between its operational modes in accordance with the operational modes of the first mentioned directional control valve.

4,286,772

FENCE SYSTEM

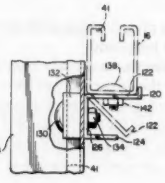
Rudolph E. Parisien, 891 Rainbow St., Ottawa, Canada

Division of Ser. No. 914,759, Jun. 12, 1978, abandoned, which is a division of Ser. No. 743,474, Nov. 19, 1976, Pat. No. 4,114,860, which is a continuation of Ser. No. 523,129, Nov. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 382,116, Jul. 24, 1973, abandoned. This application Sep. 17, 1979, Ser. No. 75,952

Claims priority, application Canada, Jun. 14, 1973, 174105; Nov. 19, 1973, 186172; Feb. 21, 1974, 193180

Int. Cl.³ E04H *17/14*

U.S. Cl. 256—65 **2 Claims**



2. A fence comprising terminal posts or corner posts, spaced-apart line posts therebetween, and a top rail forming a framework for supporting a web of fence material, each said terminal or corner post being in the form of a pair of channels having restricted openings and being disposed at right angles to each other so that the end edges of said web of fence material can be inserted into each said channel and secured therein, the walls of said channels being bent inwardly to provide portions of substantially J-shaped cross-section so as to define said restricted openings, the ends of said top rails being secured to said terminal or corner posts by sliding onto brackets secured in adjacent channels in said corner or terminal posts, each said bracket being secured to said corner or terminal post by a bolt secured to said bracket and passing through said restricted opening and through a channel washer provided with ribs received in said J-shaped portions and fastening means on said bolt for securing said bracket to said corner or terminal post, said top rail being secured to said bracket by fastening means.

4,286,773

METALLURGICAL POURING VESSELS

Jan O. Kristiansen, Olmsted Falls, and Walter A. McCray, Berea, both of Ohio, assignors to Foseco Trading A.G., Switzerland

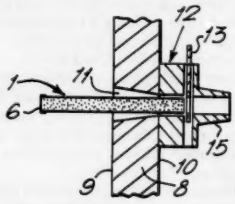
Filed Feb. 19, 1980, Ser. No. 122,758

Claims priority, application United Kingdom, Feb. 17, 1979, 05680/79

Int. Cl.³ C21C *7/00*

U.S. Cl. 266—44 **8 Claims**

1. A method of inhibiting the formation of skull in the nozzle zone of a metallurgical pouring vessel having a closable outlet nozzle comprising placing in the nozzle zone, whilst the vessel is in a generally horizontal, out of use position, an elongated container longer than the length of the nozzle zone and extending into the inside of the vessel, the container being filled with



loose anti-skulling material and having at least one hole in a sidewall, and moving the vessel into an upright position thereby causing or allowing anti-skulling material in the container to pass through the at least one hole into that part of the nozzle zone not occupied by the container.

4,286,774

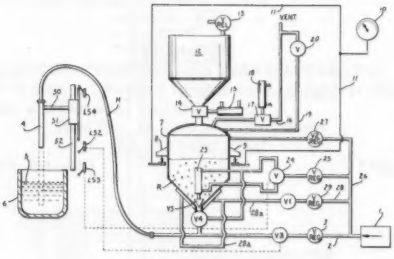
SYSTEM FOR AUTOMATICALLY INJECTING A MEASURED QUANTITY OF POWDERED REAGENT INTO A POOL OF MOLTEN METAL

Victor Benatar, 1191 Hopkins Ter., Atlanta, Ga. 30324

Filed Apr. 22, 1980, Ser. No. 142,648

Int. Cl.³ C21B *5/02*

U.S. Cl. 266—82 **11 Claims**



1. A system for automatically controlling the injection of powdered reagent from a dispenser vessel into a pool of molten metal through a conduit interconnected with said dispenser vessel and with a generally vertically disposed movable tubular lance, said system comprising lance manipulating means for imparting movement to said lance, a convey gas reservoir interconnected with said conduit valve means in said conduit and operable in coordination with movement of the lance toward said pool of molten metal and actuated by convey gas control means which is engageable by a part movable with said lance to initiate the flow of convey gas through said conduit and lance, common control means for controlling the flow of powdered reagent into said conduit and for controlling movement of the lance and actuated in coordination with continued movement of the lance toward the pool of molten metal and effective to arrest such movement of the lance and to initiate the flow of powdered reagent from said dispenser vessel through the lance and into the molten metal when the lance reaches a predetermined level, and measuring control means responsive to reduction in weight of said dispenser vessel and of powdered reagent therein for sensing the injection of a predetermined quantity of powdered reagent into said molten metal for activating said common control means and thereby to cut off the flow of powdered reagent through the lance and

to activate said lance manipulating means so as to lift the lance out of the molten metal.

4,286,775

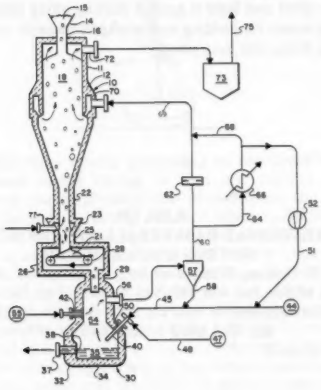
APPARATUS FOR PRODUCING MOLTEN IRON FROM IRON OXIDE WITH COAL AND OXYGEN

John C. Scarlett, Toledo, Ohio, and Charles W. Sanzenbacher, Charlotte, N.C., assignors to Midrex Corporation, Charlotte, N.C.

Division of Ser. No. 57,933, Jul. 16, 1979, Pat. No. 4,248,626. This application Sep. 19, 1960, Ser. No. 188,441

Int. Cl.³ F27B *15/00*

U.S. Cl. 266—147 **9 Claims**



1. Apparatus for reducing particulate iron oxide and producing molten iron comprising:

(a) a generally vertical shaft furnace having a particle inlet for admitting particulate iron oxide material at the top thereof and an outlet for discharging particulate material from the bottom thereof, a gas inlet intermediate the ends of the furnace for introducing a hot reducing gas to the material therein and a gas outlet for withdrawing spent reducing gas from the top thereof;

(b) a melter-gasifier vessel having a molten metal bath therein, a conduit communicating with the material discharge outlet of said shaft furnace for admitting particulate shaft furnace product of the top of said vessel, means for melting said particulate materials in said vessel, and a tap hole for withdrawing molten product from said vessel, said vessel being in sealed relationship with the discharge end of said shaft furnace;

(c) means for introducing oxygen and fossil fuel into said vessel and for directing said oxygen and fossil fuel against the surface of the molten metal bath wherein said oxygen and fossil fuel will impinge on said surface;

(d) a water injection nozzle for introducing water to the interior of said vessel to humidify the hot gases therein; and

(e) a reducing gas conduit connected to said vessel and to the reducing gas inlet of said shaft furnace for introducing humidified hot gases from said vessel to said shaft furnace as reducing gases.

4,286,776

ARRANGEMENT OF A STEEL-MAKING PLANT FOR CAPTURING AND CONDUCTING AWAY FLUE GASES

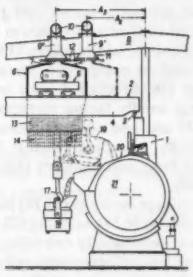
Friedrich Laimer, Perg, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed May 14, 1979, Ser. No. 38,534

Claims priority, application Austria, May 30, 1978, 3916/78

Int. Cl.³ C21C *5/38*

U.S. Cl. 266—158 **7 Claims**



1. In an arrangement of a steel-making plant for capturing and conducting away flue gases emerging during charging and pouring off, of the type including a metallurgical vessel having a vessel mouth, a container for accommodating material to be charged and poured off, and a crane for displacing said container into and out of an operating position, the improvement which comprises a discharge chimney having an opening, a crane trolley, and a hood with a draft opening, said crane trolley being disposed completely within said hood and being attached thereto so as to form a unit with said hood such that said crane trolley is only displaceable with, and while within, said hood, said hood, in the operating position, covering said container and said vessel mouth, and the draft opening of said hood bordering on said opening of said chimney so as to form a flow connection therewith.

4,286,777

MOUNT TO ABSORB SHOCKS

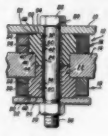
William J. Brown, Naperville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US79/00681, § 371 Date Aug. 31, 1979, 102(e) Date Aug. 31, 1979, PCT Pub. No. WO81/00606, PCT Pub. Date Mar. 5, 1981.

This PCT application filed Aug. 31, 1979, Ser. No. 95,193

Int. Cl.³ F16F *3/08*

U.S. Cl. 267—63 R **4 Claims**



1. A shock-absorbing apparatus between a platform (13) and a frame (14), said platform (13) having a fastening means (26) extending through an aperture (22) in said frame (14), support means (30) carried by said fastening means (26) on the opposite side of said frame (14) from said platform (13), the improvement comprising:

a spacer (24) extending between said platform (13) and said support means (30);

a pair of resilient bushings (16,18) encircling said fastening means (26) with one of said resilient bushings (16) being positioned between said frame (14) and said platform (13)

and the other of said resilient bushings (**18**) being positioned between said frame (**14**) and said support means (**30**);

each resilient bushing (**16,18**) having an radially extending, axially facing surface (**54**) extending axially beyond a second radially extending, axially facing surface (**52**) of said resilient bushing, said radially extending, axially facing surfaces (**52,54**) of each bushing lying in planes substantially parallel to each other and substantially parallel to said platform (**13**) and said support means (**30**);

means (**28**) on said fastening means (**26**) for urging said support means (**30**) toward said platform (**13**) to engage said spacer (**24**) between said platform (**13**) and said support means (**30**) and to compress a portion (**60**) of said resilient bushings (**16,18**) aligned with said first-named radially extending, axially facing surfaces (**54**) between said platform (**13**) and said support means (**30**), said second-named radially extending, axially facing surfaces (**52**) being spaced from said platform (**13**) and from said support means (**30**);

at least one of said resilient bushings (**16,18**) includes a pair of concentric rings (**32,34**; **36,38**), one ring (**32,36**) of said pair of rings having said two radially extending, axially facing surfaces (**52,54**) with said first-named radially extending, axially facing surface (**54**) being axially spaced from the second radially extending, axially facing surface (**52**) of said one ring (**32,36**), the compressed portions (**60**) of said bushings (**16,18**) being that portion of said one ring axially aligned with said first-named surface (**54**) and another ring (**34,38**) of said pair of rings having radially extending, axially facing surfaces (**52**) coplanar with the second radially extending, axially facing surfaces (**52**) of said one ring (**32,36**);

initial compression of said bushing compresses the portion of said one ring (**32,36**) aligned with said first-named surface (**54**) creating a shear line with the uncompressed portion of said one ring;

further compression of said bushing contacts said second radially extending, axially facing surfaces (**52**) of the one ring and of the another ring with the aligned platform and support means to compress both the remaining previously uncompressed portion of said one ring and said another ring; and

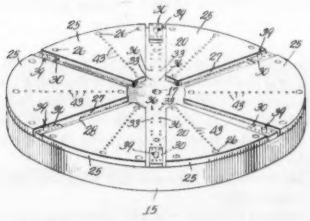
said another ring (**34,38**) being of a harder resilient material than said one ring (**32,34**) and being concentrically disposed about the periphery of said one ring, said harder concentrically disposed another ring restricts expansion of said one ring increasing the resistance to compression of said one ring thereby increasing the shock absorbing properties of the apparatus.

4,286,778

MACHINING FIXTURES

Fred R. Follmeyer, 6556 Maplewood Dr., Suite 202, Mayfield Heights, Ohio 44124

Filed Nov. 7, 1979, Ser. No. 92,095
Int. Cl.[3] **B23Q** *3/02*
U.S. Cl. 269—91 **7 Claims**



1. A fixture attachable to the table of a machine for holding a workpiece in operative relationship with a tool of the machine, said fixture comprising:

a base plate and means for locating said base plate in predetermined relation on the table of said machine and for holding a surface of said base plate against the upper surface of said table,

a plurality of supporting pads secured to an opposite surface of said base plate and upon which said workpiece is supported, each supporting pad being sector-shaped and said pads being arranged in circular fashion with adjoining margins spaced to expose therebetween passageways formed by portions of said opposite surface and said adjoining margins, said passageways extending radially from a centerpoint of the circular arrangement of said pads,

a locator block for each passageway and adjustable therealong toward and away from said centerpoint, each locator block having an abutment extending outwardly therefrom,

means for holding said locator blocks in a selected adjusted position wherein the abutments of the same engage spaced parts of a peripheral surface of said workpiece to locate the latter and hold it against shifting along said pads, and

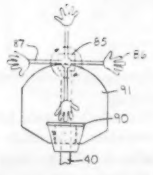
clamp means for holding said workpiece against axial separation from said base plate.

4,286,779

RECREATIONAL BASKETBALL APPARATUS WITH MOVING GOAL BARRIER

Andrew P. Collins, 3926 Dover Rd., Durham, N.C. 27705

Division of Ser. No. 829,987, Sep. 1, 1977, Pat. No. 4,202,543.
This application Feb. 11, 1980, Ser. No. 120,612
Int. Cl.[3] **A63J** *3/00*; **A63B** *63/00*
U.S. Cl. 272—3 **1 Claim**



1. A commercial basketball recreational facility comprises:

(a) an array of basketball courts grouped in spaced-apart sets on a common land area, each set of courts having a plural number of courts and each court having a goal-backboard support means and appropriate fencing shared with adjacent courts on either side thereof; and

(b) a set of elevated unique goal-backboard structures for the array of courts with one such unique structure being supported in each court on each said support means at an elevation appropriate to the game of basketball and including among the set of unique goal-backboard structures at least one such unique goal-backboard structure having a goal and backboard and structural means mounting a plurality of radially extending simulated hands in front of the backboard and rotatable about a common horizontal axis located centrally and immediately above said backboard and means to rotate said hands sequentially between the goal and the player so as to provide a moving barrier and simulate opposition by such hands to successful passage of the ball through the goal.

4,286,780

OPTICAL ILLUSION-PRODUCING ROTATING DEVICE

William R. Vermeire, 34 Oak Dr., Upper Saddle River, N.J. 07458

Filed Feb. 8, 1979, Ser. No. 10,213
Int. Cl.[3] A63J 5/00
U.S. Cl. 272—8 D 18 Claims

1. An illusionary device comprising an elongated body of predetermined outlne having at least one portion thereof twisted about the longitudinal axis of said body, the twisted portion of the body including a surface which is modified and adapted so as to have an appearance of an axially moving, sinusoidal optical wave pattern if said body is rotated, said modification to said surface of the twisted portion including a plurality of axially repeating features, any one of said features at a given axial location appearing to the viewer, when said body is rotated, as varying periodically from a point to a maximum for that feature back to a point, etc., the axially successive ones of said features, appearing to vary from a point to a maximum back to a point over the length of said twist and wherein said elongated body includes a center strip extending the length thereof and a plurality of louvered fin members extending radially outward from either side of said center strip, and wherein one axially repeating feature is each of said fin members and wherein a second axially repeating feature comprises the spaces between axially successive ones of said fin members, said device being made of material that is sufficiently rigid such that said fin members retain their radially outward orientation and their respective axial relationship, whereby the combined visual effect is such that the axial movement of said wave pattern is enhanced when said body is rotated.

4,286,781

PLAYGROUND MERRY-GO-ROUND

Paul W. Ahrens, Grinnell, Iowa, assignor to Miracle Recreation Equipment Company, Grinnell, Iowa

Filed Oct. 11, 1979, Ser. No. 84,052
Int. Cl.[3] A63G 1/14
U.S. Cl. 272—33 R 10 Claims

10. A playground merry-go-round comprising,

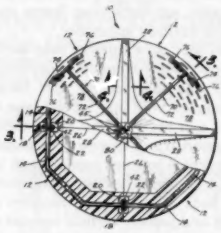
a stationery post,

a merry-go-round body having a center hub assembly being rotatably mounted on said post,

said body including a plurality of pie-shaped body sections having oppositely disposed side edges in abutting engagement with adjacent body sections,

connecting means interconnecting adjacent body sections, and

said body sections including a rigid inter frame member within the body section adjacent the outer periphery thereof, said inter frame member having oppositely disposed end plates positioned in recesses formed in said body sections and said connecting means interconnecting



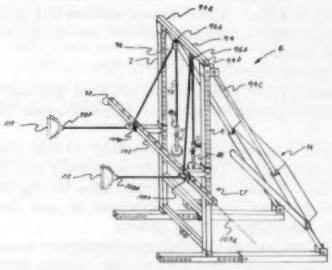
said end plates, and said recesses being shaped to expose said end plates from below said body sections for operation of said connecting means.

4,286,782

MULTI-PURPOSE EXERCISE ENHANCING DEVICE

Marious P. Fuhrhop, 8007 Greenlawn, Houston, Tex. 77088

Filed Oct. 26, 1978, Ser. No. 955,174
Int. Cl.[3] A63B 21/06
U.S. Cl. 272—117 1 Claim



1. A multi-purpose exercise enhancing apparatus which is easily assembled for free standing use on a horizontal support surface and which apparatus may be readily disassembled for storage and ease of transportation, said apparatus comprising:

first and second base members;

first and second vertical support members extending vertically upward from first and second base members, said first first vertical support member extending upwardly from said base member and said second vertical support member extending upwardly from said second base member;

said first and second base members spaced apart a predetermined distance for stabilizing and maintaining said first and said second vertical support members for use in a free standing vertical relationship to a substantially horizontal support surface;

means for releasably connecting said respective base members and said vertical support members to enable disassembly of the exercise enhancing device when desired for storage, ease of transportation, and the like;

a first horizontal member having one end secured with said first vertical support member and the other end secured with said second vertical support member;

a second horizontal member having one end secured with said first vertical support member and the other end secured with said second vertical support member, said second horizontal member disposed a preselected distance from said first and second base members, said first hori-

zontal member located between said second horizontal member and said first and second base members;

said first and second vertical support members when operably connected with said first and second base members forming a stable, self-supporting frame on the horizontal surface for the exercise apparatus;

first and second user back support base members, said first user back support base member connected with said first base member and said second user back support base member connected with said second base member;

first and second user back support frame members, said first user back support frame member connected at a first end to said first vertical support member and at a second end to said first user back support base member, and said second user back support frame member connected at a first end with said second vertical support member and at a second end with said second user back support base member, said first and second user back support frame members forming an inclined guide means which guides a user supporting panel;

a user support panel mounted on said first and second back support frame members for movement on said guide means;

handle means mounted with said back support panel for gripping by a user while performing inclined deep knee bend-type exercises with a portion of the user's weight supported by said back support panel wherein a self-supporting exercise apparatus for use on a horizontal support surface that may be easily disassembled is provided;

a third horizontal member for releasable attachment at a first end with said first vertical support member and for releasable attachment at a second end with said second vertical support member;

first and second cables;

a first cable support pulley means mounted with said third horizontal member for operably supporting said first cable;

a second cable support pulley means mounted with said third horizontal member for operably supporting said second cable, each of said first and second cables having first and second ends and operably supported by said first and second cable support pulley means;

first and second means for holding a preselected magnitude of exercise weights said first weight holding means secured with said first end of said first cable and said second weight holding means secured with said first end of said second cable; and

first and second handles for holding by user, said first handle being secured to said second end of said first cable and said second handle being secured to said second end of said second cable for lifting the exercise weights independently of one another by pulling on said handles to perform cable pull exercises.

4,286,783

PRACTICE BASEBALL

Nelson F. Newcomb, and Nelson F. Newcomb, Jr., both of Mirror Lake, N.H. 03853

Continuation-in-part of Ser. No. 954,629, Oct. 25, 1978, abandoned, which is a continuation-in-part of Ser. No. 737,841, Nov. 1, 1976, Pat. No. 4,128,238. This application May 22, 1980, Ser. No. 152,510

The portion of the term of this patent subsequent to Dec. 5, 1995, has been disclaimed.

Int. Cl.[3] **A63B** *37/14*

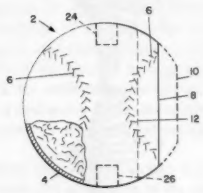
U.S. Cl. 273—26 R **5 Claims**

1. A practice baseball adapted to be thrown by baseball pitchers, said baseball comprising

a. two distinct outer surfaces one of which comprises the major spherical portion of the surface of a sphere and the other surface has a shape other than that of said major spherical surface,

b. the area of said major spherical portion being between 70% and 93% of the area of a sphere of the same major diameter,

c. the annular part of the major spherical portion lying between (1) the juncture of the said major spherical portion and said other surface, and (2) a great circle parallel to said juncture, is large enough to accept at least one finger of the thrower's hand when the ball is held in the ball gripping position required for throwing a conventional baseball as a straight ball,



d. the weight of said practice baseball being between 1¼ and 7 ounces and the major diameter of said practice baseball being between 2 and 4 inches, and

e. the relationship between the weight and diameter of said practice baseball being such that when the said practice baseball is thrown in the manner that a straight ball is thrown by baseball pitchers, it will curve to a controllable degree.

4,286,784

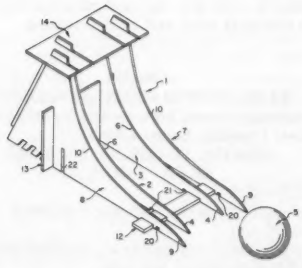
BOWLING PRACTICE DEVICE

Leslie E. Harvey, Mountain View, and Stephan D. Spiva, Sunnyvale, both of Calif., assignors to Carlos Enterprises, Menlo Park, Calif.

Filed Jul. 12, 1979, Ser. No. 56,804

Int. Cl.[3] **A63B** *69/00*

U.S. Cl. 273—54 D **15 Claims**



14. A practice bowling apparatus comprising: means for intercepting a rolling bowling ball and returning it to the roller thereof, said intercepting means comprising a pair of spaced rail members each having a ball receiving surface which is curved rearwardly and upwardly from the forward lower end thereof over substantially its entire length.

4,286,785

TENNIS GAME BOARD

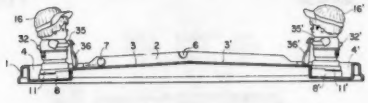
Masatoshi Todokoro, 2-33 Koganehara 2-chome, Matsudo-shi, Chiba-ken 270, Japan

Filed Jun. 11, 1980, Ser. No. 158,471

Claims priority, application Japan, Aug. 16, 1979, 54/112569[U]; Aug. 16, 1979, 54/112570[U]; Aug. 16, 1979, 54/112571[U]; Aug. 16, 1979, 54/112572[U]

Int. Cl.³ A63F *7/06*

U.S. Cl. 273—85 D **13 Claims**



1. A tennis game board mounted with the animated racket-supporting bodies disposed opposedly to each other across the board surface, each of said racket-supporting bodies having provided therein a main shaft and a racket driving shaft to which a racket is secured, said main shaft having mounted thereon a cam plate formed with a curved groove designed to convey to said racket a movement for striking a ball rolling down on the board surface and a windup spring adapted to transmit rotative force to said main shaft, said racket driving shaft having joined thereto an end of a follower whose other end is connected to said cam plate.

4,286,786

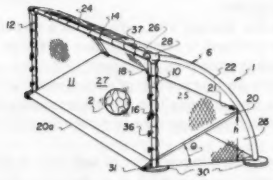
SOCCER TRAINING GOAL

Andreas T. Papadopoulos, 31 E. Edsall Ave., Palisades Park, N.J. 07650

Filed May 18, 1978, Ser. No. 906,935

Int. Cl.² A63B *71/02*

U.S. Cl. 273—396 **9 Claims**



1. A soccer training goal comprising

a goal frame,

a net connected to said goal frame defining a goal space with a goal opening,

an inclined plate connected to said frame at the bottom of said goal space inclined downwardly toward the goal opening, whereby a soccer ball directed through said goal space is deflected by said net so as to initially retain the soccer ball within said goal space and whereby the soccer ball rolls down said inclined plate and out of said goal space back to the practicing kicker,

adjustment means connected between said inclined plate and said goal frame for adjusting the degree of incline of said inclined plate and varying the speed at which the soccer ball leaves said goal space,

said goal frame comprising a pair of uprights, a cross member connected between said uprights defining said goal opening, a pair of quadrantal braces connected to adjacent tops of said uprights adjacent said cross member extending rearwardly and downwardly of said goal opening, said adjustment means comprising a cylinder slideable mounted within each of said quadrantal braces connected to said inclined plate, and a cable connected to each cylinder extending through each of said quadrantal braces and out thereof adjacent said goal opening.

4,286,787

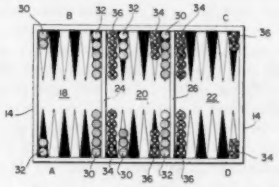
FOUR PLAYER BACKGAMMON

Herbert L. Barber, Liverpool, N.Y., assignor to Double Backgammon Enterprises, Inc., Newport, R.I.

Filed May 12, 1980, Ser. No. 149,651

Int. Cl.³ A63F *3/00*

U.S. Cl. 273—248 **5 Claims**



1. A backgammon game adapted to be played by four persons competing against each other either individually or as opposing two-man teams, said game comprising a generally rectangular playing board having opposed elongated edges connected at their extremities by shorter end edges, a pair of spaced bar portions extending between said opposed elongated edges and dividing said board into three substantially equal sections, each having conventional backgammon points marked thereon whereby the center section in combination with either outer section defines a conventional backgammon playing surface, said game further comprising four sets of playing pieces visually distinguishable from each other, two of said sets of playing pieces being arranged at the outset of game play on one of said outer sections and said center section in conventional backgammon arrangement, and the other two sets being arranged on the other of said outer sections and said center section in conventional backgammon arrangement.

4,286,788

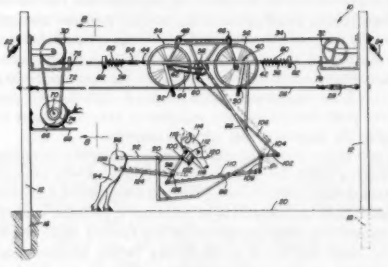
MECHANICAL ROPING STEER

Jack F. Simington, Box 141, Star Rte., and William E. Ray, Box 100, Star Rte., both of Chiloquin, Oreg. 97624

Filed Oct. 24, 1979, Ser. No. 88,070

Int. Cl.³ A63B *69/00*

U.S. Cl. 273—359 **7 Claims**



1. A mechanical roping steer assembly including a pair of elevated horizontally spaced apart mounting structures, a pair of drive and idle pulleys journalled from said mounting structures, an elongated flexible tension member trained about said pulleys and arranged in two generally parallel reaches, an elongated support member extending between and anchored relative to said mounting structures, a wheeled carriage supported from said support member for rolling therealong, a crank journalled from said carriage, drive means drivingly

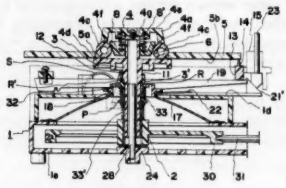
connecting a wheel of said carriage to said crank, said carriage including a depending support structure projecting downwardly below said reaches, said support member and said carriage and including a lower portion, an arm portion projecting horizontally outwardly from said lower portion of said support structure in one direction along said support member and including a free end portion, an animal simulating structure supported from said free end portion and including at least a first oscillatable head simulating body part, connecting structure connecting said crank to said body part for oscillation of the latter in response to rotation of the crank, said head simulating body part disposed at an elevation above said free end of said arm and spaced below said reaches, said support member and said carriage, said animal simulating structure defining front and rear ends spaced along said support member with said head simulating body part defining said front end, said front end facing toward and spaced horizontally rearwardly from said lower portion of said depending support structure, reversible rotary drive motor means drivingly connected to said drive pulley, one of said reaches of said flexible tension member being anchored relative to said frame.

4,286,789

SIMPLIFIED RECORD PLAYER

Katsumi Watanabe, Kawasaki, Japan, assignor to Yugen Kaisha Watanabe Kenkyusho, Kanagawa, Japan

Filed Nov. 19, 1979, Ser. No. 95,157
Claims priority, application Japan, Nov. 9, 1978, 53-147524
Int. Cl.[3] G11B *17/00*
U.S. Cl. 369—244 **7 Claims**



1. In a simplified record player of the type which comprises a normally upwardly biased push button which defines means for holding a record disc, the record disc being lowered by depression of the push button such that the lower face of the disc, having reproducing grooves, engages with an upwardly projecting reproduction stylus carried by the record player; a latch shaft having an upwardly facing end face for latching a latch piece, the latch piece being normally biased toward the outer periphery of the latch shaft such that the push button and the record disc are maintained together in a depressed state, and actuating link means which pushes the latch piece so as to release it from engagement with the latch shaft thereby permitting the push button and record disc to return to their initial position, the improvement which comprises:

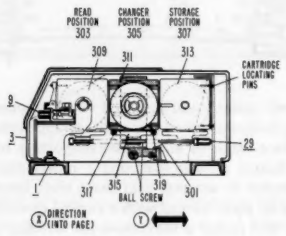
an upwardly extending shaft member assembly including (a) a drive shaft, (b) a tubular shaft telescopically coupled to said drive shaft so as to be rotated integrally with the drive shaft only in a direction of rotation, (c) a latch shaft fitted around the outer periphery of the tubular shaft; the tubular shaft having a downwardly facing stepped portion formed on the outer periphery thereof; the latch shaft having a flange and an upper end face formed at a predetermined space thereon, the flange and upper end face each acting as a latch face, the latch shaft having an upwardly facing stepped portion formed interiorly thereof; a first spring means resiliently biasing the tubular shaft such that the tubular shaft is supported at the downwardly facing stepped portion by the upwardly facing stepped portion of the latch shaft, and a second spring means resiliently biasing the latch shaft such that the latch shaft is supported upwardly under resilient force imparted by the second spring means.

4,286,790

OPTICAL DISC CHANGER APPARATUS

Bohdan W. Siryj, Cinnaminson, and Alan P. Gilson, Collingswood, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 23, 1979, Ser. No. 41,678
Int. Cl.[3] G11B *17/00, 5/48*
U.S. Cl. 369—36 **4 Claims**



1. In a data storage system for optically reading information stored on an optical disc, said system having a storage module having a plurality of storage locations for storing said optical disc enclosed in a protective cartridge, the system having a reader for optically reading information stored on said optical disc, a disc changer, comprising:

a carriage having at least two positioning and retracting carriers for supporting said disc enclosed in said protective cartridge during transfer between said storage module and said reader;

means, connected to said carriers, for gripping said protective cartridge during transfer between said storage module and said reader;

first means for driving said carriage in a direction to align said disc enclosed in said protective cartridge with one of said plurality of storage locations;

second means for driving one of said at least two positioning and retracting carriers in a direction normal to the direction in which said carriage is driven by said first means; and

third means for driving another of said at least two positioning and retracting carriers in a direction parallel to the direction in which said second means is driven;

said first driving means being operated simultaneously with said second driving means when said one of said at least two positioning and retracting carriers is not supporting said disc and with said third driving means when said another of said at least two positioning and retracting carriers is not supporting said disc.

4,286,791

PACKING ASSEMBLY FOR A MOVABLE SHAFT

Douglas K. McLean, Dallas, Tex., assignor to Double-E Inc., Dallas, Tex.

Filed Jan. 14, 1980, Ser. No. 111,802
Int. Cl.[3] F16J *15/06, 15/18*
U.S. Cl. 277—64 **21 Claims**

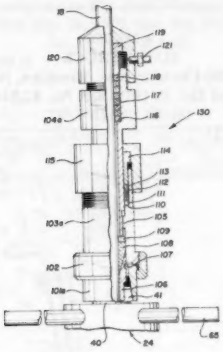
1. In a packing assembly for a movable shaft which projects from a housing to be sealed, said packing assembly comprising

a gland body having threaded means at its proximal end for sealing attachment to said housing; said body providing a first packing chamber confronting said shaft adjacent to said proximal end, a first annular packing body disposed in said first packing chamber;

an elongated tubular mandrel surrounding said shaft, having its proximal end disposed within said gland body for com-

pressing said first packing body within said first packing chamber;

said gland body providing a second packing chamber, confronting said mandrel adjacent to its proximal end; a second annular packing body disposed in said second packing chamber; means including a packing cap threadedly mounted on the distal end of said gland body for compressing said second packing body within its respective chamber;



said mandrel providing a third packing chamber, adjacent to its distal end, confronting said shaft; a third annular packing body disposed in said third packing chamber; means including a packing cap threadedly mounted on the distal end of said mandrel for compressing said third packing body within its respective chamber;

and means coupling said gland body and said mandrel for effecting axial movement of said mandrel relative to said body, for compressing said first packing body in its respective packing chamber.

4,286,792

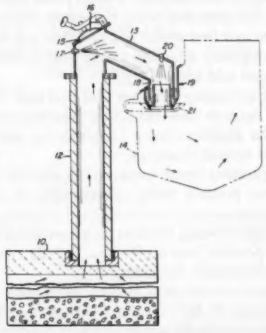
SELF-REPLENISHING SEAL FOR THE GAS OFFTAKE PIPING OF A COKE OVEN AND SEALING METHOD

Robert E. Hagedorn, North Huntington Township, Westmoreland County; Alphonse T. Lobue, Elizabeth Forward Township, Allegheny County, both of Pa., and Joseph G. Uhlman, Lone Star, Tex., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 10, 1980, Ser. No. 128,797

Int. Cl.³ F16J *15/40*

U.S. Cl. 277—135 **2 Claims**



1. In a combination which includes a coke oven, a collector main, gas offtake piping connecting said oven and said main, means in said piping for supplying flushing liquor to said main, and a seal between said piping and said main allowing relative movement, the improvement in which said seal comprises liquid retaining means on said main, said piping extending into said liquid retaining means, said liquid retaining means being located under said means for supplying flushing liquor to catch some of the flushing liquor for automatically replenishing liquid lost therefrom, and means overlying said liquid retaining means to prevent direct impingement of flushing liquor and steam jets on liquid already within said liquid-retaining means, but admitting flushing liquor thereto.

4,286,793

ICE BREAKING AND MUD DEFLECTING DEVICE FOR A BALL SCREW AND NUT ASSEMBLY

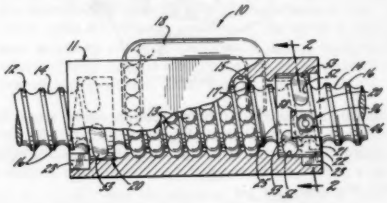
Helmut Ploss, Stuttgart, and Alfons Remensperger, Nürtingen, both of Fed. Rep. of Germany, assignors to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed Jul. 20, 1979, Ser. No. 59,398

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1978, 2835551

Int. Cl.³ F16J *15/16;* **F16H** *55/22*

U.S. Cl. 277—165 **7 Claims**



1. An ice breaking and mud deflecting device for a ball screw and nut assembly having a nut and a screw each formed with a helical ball groove, said device comprising a ring adapted to fit non-rotatably into one end portion of said nut, a stripper extending helically around the inside of said ring at a lead angle corresponding to the lead angle of the ball groove of said screw, said device being characterized in that said stripper is formed by a flexible strip secured to said ring and positioned to fit within the ball groove of said screw, said strip having one end located adjacent the outboard edge of said ring, said stripper further comprising an insert formed separately from said strip and made of substantially inelastic material, said insert being located adjacent said one end of said strip and extending over a considerably shorter circumferential angle than said strip, and resiliently yieldable means acting on said insert and urging the latter radially inwardly into the ball groove of said screw.

4,286,794

PROTECTIVE FLEXIBLE SEALED ENCLOSURE FOR A STEERABLE DRIVE WHEEL OF A VEHICLE

Charles W. Milstead, Rte 5, Box 252, and Larry Ridenour, Rte. 6, Box 8, both of McMinnville, Tenn. 37110

Filed Jun. 20, 1979, Ser. No. 50,471

Int. Cl.³ F16D *3/84*

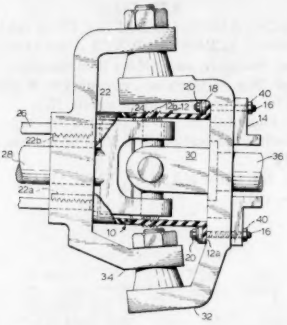
U.S. Cl. 277—212 FB **2 Claims**

1. A sealed enclosure mounted between a steerable wheel on a vehicle and a drive axle tube, for protecting the universal joint, the wheel housing, and the drive axle opening for a steerable drive wheel of a vehicle, the enclosure comprising:

a substantially cylindrical housing, said housing including a flexible wall portion to allow angular movement of one end of said housing relative to the longitudinal axis of the housing, said flexible wall portion of said housing having spaced apart pre molded pleated wall segments along

opposite lateral sides of the housing, said pleated wall segments being disposed between cylindrical portions of said housing and being expandable and contractable along the lateral sides of the housing to allow angular movement of one end of the housing relative to the longitudinal axis of the housing;

a rigid sleeve adhesively bounded to one end of said housing, said sleeve having first and second connected tubular sections, said first tubular section having a larger diameter than said second tubular section, said first tubular section being sized in diameter at substantially the same diameter of said cylindrical flexible housing and adhesively joined



thereto, said second tubular section being sized for a sealed fit within said axle tube, said second tubular section having exterior concentric peripheral flanges for providing a better seal between the second tubular section and the axle tube; and

means disposed at the other end of said housing for attaching said housing to said steerable wheel including

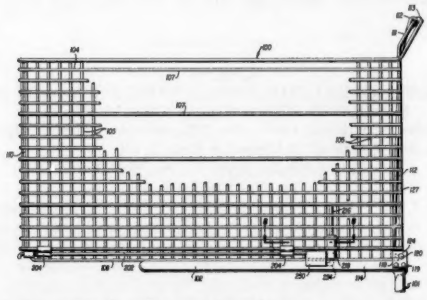
a peripheral lip disposed in a plane perpendicular to the longitudinal axis of said flexible housing at the end opposite the end connected to said rigid sleeve, said peripheral lip being integrally formed with said flexible housing and sized for flush engagement with a rigid ring which is used to attach said housing to said steerable wheel.

4,286,795

TELESCOPING SHOPPING CART

B. Houston Rehrig, 1401 S. Oak Knoll Ave., Pasadena, Calif. 91109

Filed May 7, 1979, Ser. No. 36,647
Int. Cl.³ B62B *1/10*
U.S. Cl. 280—33.99 H **21 Claims**



1. A nestable shopping cart comprising:

a basket having opposed side panels, each side panel having opposed edges which are parallel;

a wheeled frame;

hinging means pivotally coupling said basket to said frame for permitting said basket to be rotated from a horizontal use position to a predetermined upper position for nesting;

latching means releasably coupling said basket to said frame for maintaining said basket in a horizontal use position and for biasing said basket to said predetermined upper position when said basket is uncoupled from said frame; and

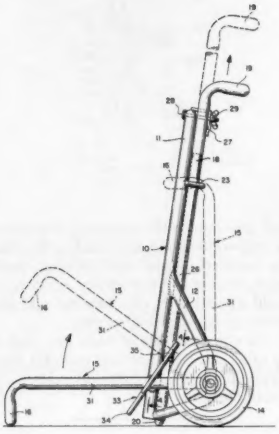
release means coupled to said latching means for releasing the latching means during nesting whereby said basket is rotated to said predetermined upper position.

4,286,796

HAND TRUCK

Patsy Esposito, 350 Clarkson Ave., Brooklyn, N.Y. 11226

Filed Oct. 9, 1979, Ser. No. 82,944
Int. Cl.³ B62B *1/02*
U.S. Cl. 280—47.27 **3 Claims**



1. A collapsible hand truck comprising:

a U-shaped tubular frame having first and second legs;

a handle attached to said frame;

first and second axle supports having aligned holes therein affixed to and extending behind said first and second legs;

an axle extending through said aligned holes;

first and second wheels on said axle, said first and second wheels being disposed outside said first and second legs respectively;

a tubular platform having first and second arms joined together by a lip which is bent at right angles to said first and second arms and includes a cross piece extending therebetween, said first arm being hingeably attached to said axle between said first wheel and said first leg, said second arm being hingeably attached to said axle between said second wheel and said second leg;

a crossbar extending between said first and second legs and having support ends extending therebeyond;

said tubular platform being hingeable on said axle between first and second positions;

said first position being substantially parallel to said frame;

said second position being substantially at right angles to said frame;

said cross piece being restable on a horizontal surface in said second position and is effective to hold said tubular platform substantially horizontal;

said first and second arms being spaced apart to provide an interference fit between said first and second arms and said first and second legs in said first position whereby said tubular platform is held in said first position until forcibly moved from said first position; and

said support ends being positioned below and contiguous to

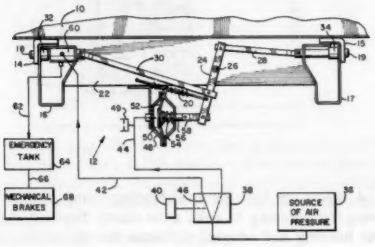
said first and second arms when said platform is in its second position and effective to support said platform and any load thereon when said frame is tilted rearward on said wheels to raise said cross piece from said horizontal surface.

4,286,797

PIN RETRACTING MECHANISM FOR A TRAILER

George Mekosh, Jr., Warrington, and David O. Hulse, Lionville, both of Pa., assignors to The Budd Company, Troy, Mich.

Filed Sep. 24, 1979, Ser. No. 77,898
Int. Cl.³ B60G *5/06*
U.S. Cl. 280—80 B **8 Claims**



1. In combination with a trailer with tracks connected thereto for receiving rails connected to a bogie, with the bogie having structure including a movable pin element disposed to pass from the rails through a selected opening in one of the tracks to lock the bogie in place beneath the trailer during operation, with the pin element being disposed to be removed from the opening in said track when the trailer is being repositioned over the bogie or separated from the bogie when the trailer is not operated,

a power actuated retracting mechanism comprising:

a. spring biasing means connected to normally urge said pin element into a locking position from said rail through an opening in at least one of said tracks;

b. a source of air pressure;

c. means responsive to said air pressure to overcome the bias of said spring biasing means to move said pin element from said locking position out of the opening of said one track of said trailer; and

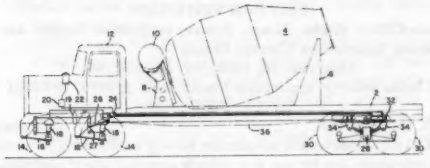
d. means for selectively connecting said source of air pressure to said means responsive to said air pressure.

4,286,798

TRUCK WITH STEERABLE REAR WHEELS

Claude O. Butler, 11270 Chalet Rd., R.R. #1, Sidney, B.C., Canada (V8L 3R9), and Clifford G. Burrows, 9245 E. Saanich Rd., Sidney, B.C., Canada (V8L 1H6)

Filed May 29, 1979, Ser. No. 43,550
Int. Cl.³ B62D *7/04*
U.S. Cl. 280—81.5 **4 Claims**



1. An automatic steering system for use upon a vehicle having a driving position and a unitary frame supported by two or more sets of selectively steerable wheels longitudinally spaced along the frame which may simultaneously be given a complementary orientation by a single control device or alternatively oriented individually, comprising:

a first set of steering wheels functionally interconnected with a control device at the driving position,

a turntable, movable through an arc substantially greater than 2°, to which a second set of wheels are mounted, said wheels being driving wheels and having an orientation entirely controlled by a self-centering hydraulic spool valve movably mounted to the framework and interconnected with the control device at the driving position, said valve means including an intermediate or neutral position and opposing extreme position selectively directing fluid to one of a pair of opposing hydraulic rams interconnected with and controlling the position of the turntable and attached second set of wheels such that when the valve is in the intermediate position, no additional fluid is directed to the rams and when it is in a position other than the intermediate position, additional fluid is directed to one of the rams, selectively urging the rear wheels to turn until the valve is in the intermediate position,

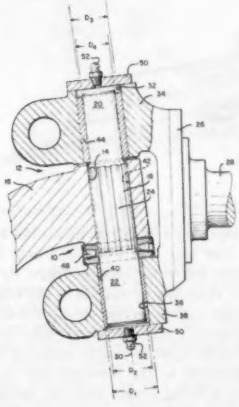
means interconnecting the valve body to one set of wheels and means interconnecting the spool to the other set of wheels such that the condition of the valve depends upon the relative orientation of the two sets of wheels and when the two sets of wheels are properly tracking the valve is in the intermediate position holding the wheels in that orientation until the relative position of the spool is changed, and means to override the control device such that the operator may control the orientation of the second set of wheels independently from the first set.

4,286,799

KINGPIN ASSEMBLY AND METHOD FOR MAKING SAME

Robert L. Ayres, New Wilmington, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Sep. 18, 1979, Ser. No. 76,654
Int. Cl.³ B62D *7/18*
U.S. Cl. 280—96.1 **11 Claims**



1. A kingpin assembly for a steering axle of the type which includes an inner axle member having a mounting bore at each end thereof and is capable of supporting said kingpin assembly at said each end which in turn pivotally supports a steering knuckle and spindle extending outwardly therefrom, said steering knuckle including rigid first and second yoke arms having axially aligned first and second cylindrical bores respectively therethrough, said kingpin assembly comprising:

a kingpin having first and second end sections and an intermediate section therebetween;

said first section being cylindrical with a first diameter less

than the diameter of said first cylindrical bore and the diameter of said second cylindrical bore;

said second section being cylindrical with a second diameter less than said diameter of said second cylindrical bore;

said intermediate section being generally cylindrical with a helically splined outer surface and having an outer diameter greater than said first diameter of said first section and less than said diameter of said second cylindrical bore so that said first section and said intermediate section can be axially passed through said second cylindrical bore during assembly;

said mounting bore having a splined inner surface with the splines thereof being parallel with an axis of said mounting bore, said mounting bore having a cross sectional shape generally matching a cross sectional shape of said intermediate section of said kingpin, said mounting bore having a minimum internal diameter greater than said first diameter of said first section of said kingpin so that said first section of said kingpin can be axially passed through said mounting bore during assembly;

said intermediate section of said kingpin being rigidly retained within said mounting bore by an interference fit between said helically splined outer surface and said splined inner surface of said first section and said second section extend outwardly of said mounting bore of said inner axle member;

said first yoke arm being pivotally mounted about said first section of said kingpin; and

said second yoke arm being pivotally mounted about said second section of said kingpin.

4,286,800

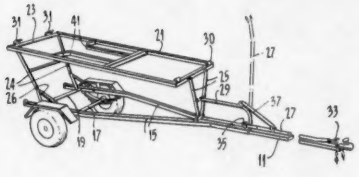
TRAILER

James W. Lomas, 122 Gloucester Crescent, Shoalwaterbay W.A. 6169, Australia

Filed Sep. 6, 1979, Ser. No. 72,995

Int. Cl.³ B60P *3/10*

U.S. Cl. 280—414 B **10 Claims**



1. A trailer comprising a wheeled chassis and a load support frame having a rear end and a forward end, said wheeled chassis being connected to the support frame by a linkage for moving the frame vertically in relation to the wheeled chassis, wherein said linkage includes a rear strut pivotally mounted to the chassis and pivotally mounted to the rear end of the support frame, a forward strut pivotally mounted to the chassis and pivotally mounted to the forward end of the support frame, the rear strut being longer than the forward strut and the pivotal mountings of the rear strut and the forward strut to the chassis being substantially in the plane of the chassis, lever means mounted to and extending from the forward strut for moving the support frame vertically in relation to the chassis between a raised position and lowered position and locking means for locking the lever means in at least the raised position and retaining the support frame in a raised position in relation to the chassis; said rear strut and said forward strut cooperating with said frame and said chassis to maintain the pivotal mounting of the rear strut to the chassis forward of the pivotal mounting of the rear strut to the support frame between the raised and lowered positions.

4,286,801

SAFETY TOE UNIT FOR A SKI BINDING

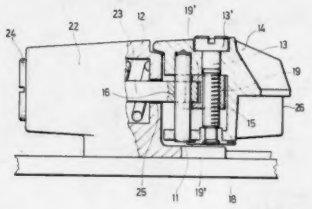
Manfred Richert, Farchant, Fed. Rep. of Germany, assignor to Vereinigte Baubeschlagfabriken Gretsch & Co. GmbH, Fed. Rep. of Germany

Filed Jan. 23, 1980, Ser. No. 114,590

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1979, 2904660

Int. Cl.³ A63C *9/08*

U.S. Cl. 280—629 **12 Claims**



1. A safety toe unit for a ski binding comprising a binding housing for fastening to a ski, a toe clamp disposed at the rear of the housing and adapted to locate the toe portion of a ski boot, a vertically extending freely rotatable but axially located adjustment screw carried by said toe clamp for adjusting the vertical height thereof, spring means adapted to draw the toe clamp against the housing via a draw rod disposed within the housing and extending through an opening therein said opening being sized to locate the draw rod in the vertical direction but to permit sideways movement thereof, a first pair of complementary abutment surfaces provided between the toe clamp and the housing and located to one side of the draw rod, a second pair of complementary abutment surfaces provided between the toe clamp and the housing and located to the other side of the draw rod, said first and second pairs of complementary abutment surfaces defining respective first and second pivot axes respectively enabling sideways pivotal movement of the sole clamp to a respective side of a housing with simultaneous separation of the pair of complementary abutment surfaces defining the other of said pivot axes and simultaneous movement of said draw rod, there being further provided a pivot pin arranged parallel to said adjustment screw and located in bores in the toe clamp for directly pivotally connecting said toe clamp to said draw rod, said pivot pin being vertically displaceable relative to one of said toe clamp and said draw bar, and said adjustment screw being connected to said draw rod via a screw-threaded connection whereby adjustment of said adjustment screw varies the vertical position of said toe clamp but the force of said spring means does not act on said adjustment screw.

4,286,802

OLEOPNEUMATIC SUSPENSION WITH TELESCOPIC LEG FOR VEHICLES

Alain-Gilbert Roche, Massy, France, assignor to Societe Anonyme Automobiles Citroen, France

Filed Jan. 30, 1980, Ser. No. 116,799

Claims priority, application France, Feb. 2, 1979, 79 02801

Int. Cl.³ B60G *3/00*

U.S. Cl. 280—693 **13 Claims**

1. An oleopneumatic suspension having a substantially vertical telescopic leg for use in a vehicle steering wheel assembly, comprising:

a lower element for supporting a vehicle wheel connected by a substantially transverse articulated lever to the structure of the vehicle,

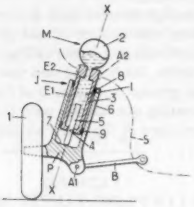
an upper element articulated to the structure of the vehicle and serving to guide the lower element, these two ele-

ments being slidable in relation to each other along an axis, and

means for causing a pressurized liquid to act between said elements in such a way that this liquid tends to separate the two elements one from the other along said axis,

the improvement being that one of the two elements includes

(i) an elongated tubular member having at one end a bore and an elongated piston of no greater diameter through-



out its length than said bore, said piston being adapted for sealed sliding in this bore in a direction parallel to its longitudinal axis, the pressurized liquid being contained in the inner volume of this tubular member sealed by the piston,

whereas the other element includes

(ii) a cylinder surrounding the tubular member and coaxial therewith, this cylinder being closed at one end by a bottom against which said piston bears.

4,286,803

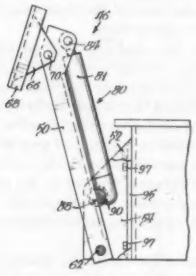
STABILIZER ASSEMBLY

John C. Schulz, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Oct. 2, 1978, Ser. No. 947,549

Int. Cl.³ B60R *27/00*

U.S. Cl. 280—764 **4 Claims**



1. A stabilizer assembly for a vehicle having a frame, comprising:

bracket means secured to and extending laterally outward from said frame;

a stabilizer arm having a fixed end nested within and pivoted to said bracket means about a stabilizer pivot and having a moving end extending therefrom for movement between a ground engaging support position and a generally upright transport position, the horizontal axis passing through said stabilizer pivot defining a stabilizer pivot axis;

fluid ram means, connected to said bracket means and said moving end of said stabilizer arm, for moving said stabilizer arm between said support and said transport positions with a ram centerline extending through said connection of said fluid ram means to said moving end; and

connecting means, nested within said bracket means, for eccentrically connecting said fluid ram means to said bracket means, said connecting means being rigidly attached to said fluid ram means and pivotally joined to said bracket means about a ram pivot axis spaced from said stabilizer pivot axis,

said connecting means including a pair of spaced circular journals rotatably supported by said bracket means for rotation about said ram pivot axis, and a ram support portion connected with and extending between said journals and radially offset from said ram pivot axis, said ram support portion being rigidly attached to said fluid ram means for supporting said fluid ram means for eccentric pivoting about said ram pivot axis, said journals and said ram support portion forming a generally U-shaped member,

whereby the moving end of said stabilizer arm is drawn closer to said frame and maintained more upright when it is in the transport position and the moment arm produced by said fluid ram means in rotating said stabilizer arm to the support position is greater relative to a stabilizer assembly whose ram pivot axis is not offset from the ram centerline, and said stabilizer arm and portions of said journals are in overlapping relation when said stabilizer arm is in said transport position.

4,286,804

SEAT-BELT SYSTEM

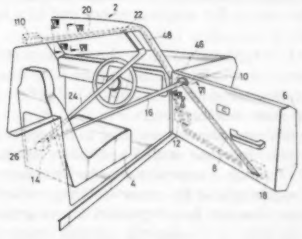
Naozane Maekawa, Toyokawa, and Takeshi Awano, Okazaki, both of Japan, assignors to Mitsubishi Jidasha Kogyo Kabushiki Kaisha, Japan

Filed Sep. 10, 1979, Ser. No. 74,123

Claims priority, application Japan, Sep. 12, 1978, 53-111923; Nov. 8, 1978, 53-137476

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—803 **41 Claims**



1. A seat-belt system comprising a first guide provided on a door, the door being on one side of a car seat and the front end thereof being hinged to a car body, so as to extend from the lower rear to the upper front of the door, run-through means having an opening for permitting a belt to pass therethrough and guided by the first guide, a hip-belt anchor fastened to either of the seat and car body so as to rest near the car center side of the seat, a hip-belt retractor fastened to the lower rear of the door, a hip belt with one end thereof connected to the hip-belt anchor and the other end passed through the run-through means and wound around the hip-belt retractor fastened to the lower rear of the door, a second guide attached to a car roof rail on one roof side above the seat so as to extend along the longitudinal axis of the car body, a shoulder-belt anchor guided by the second guide, a shoulder-belt retractor fastened to either of the seat and car body so as to rest near the car center side of the seat, releasing means interposed between the shoulder-belt retractor and either of the seat and car body for releasing the shoulder-belt retractor therefrom, a shoulder belt with one end thereof connected to the shoulder-belt anchor and the other end wound around the shoulder-belt retractor, and driving means responsive to the opening and closing of

the door for moving the run-through means to the upper end of the first guide and the shoulder-belt anchor to the front end of the second guide when the door opens, and for moving the run-through means to the lower end of the first guide and the shoulder-belt anchor to the rear end of the second guide when the door closes.

4,286,805

SEATBELT SYSTEM

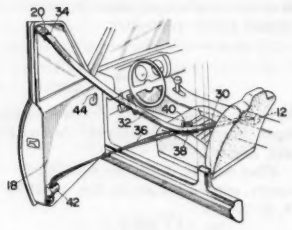
Muneharu Matsunami, Seto; Tatsushi Kubota, Okazaki; Akio Yoshida, and Nobuyuki Inokuchi, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Tokai Rika Denki Seisakusho, both of Aichi, Japan

Filed Oct. 30, 1979, Ser. No. 89,444

Claims priority, application Japan, Oct. 31, 1978, 53-150088[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—803 **9 Claims**



1. A seatbelt system comprising:

(a) a first retractor secured to the substantially central portion of the vehicle for winding up one end of a lap inner webbing;

(b) a second retractor secured to the lower portion of a vehicle door for winding up one end of a lap outer webbing, the other end of which is secured to the forward end of said lap inner webbing; and

(c) an engageable member for securing to the upper portion of the vehicle door one end of a shoulder webbing, the other end of which is secured to the forward ends of said lap inner webbing and lap outer webbing; whereby the webbings are attached to or separated from a seated occupant by opening or closing the vehicle door, thereby automatically fastening the webbings to or unfastening same from the occupant.

4,286,806

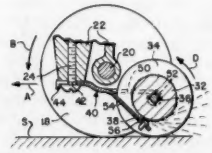
ROLLER SKATING SPARK GENERATOR

David Bergstein, R.R. 3 Indian Hill Rd., Pound Ridge, N.Y. 10576

Filed Mar. 6, 1980, Ser. No. 127,923

Int. Cl.³ A63C *17/26*

U.S. Cl. 280—816 **4 Claims**



1. In combination with a conventional roller skating device having a screw in its wheel support structure, a spark-generating mechanism which comprises:

an axle;

a grindstone wheel, centrally and fixedly mounted on said axle;

a pair of actuating wheels of a diameter larger than the diameter of said grindstone wheel, said actuating wheels being fixedly mounted on said axle on either side of said grindstone wheel;

a spark-producing element held resiliently in contact with the peripheral end surface of said grindstone wheel; and

bracket support means for journalling the ends of said axle for free rotation, for holding said spark-producing element against said grindstone wheel, and for attaching the entire spark-generating mechanism with the screw of the wheel support structure of the roller skating device.

4,286,807

SCREW COUPLING SAFETY MECHANISM

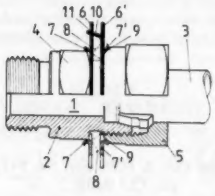
Ernst Bächli, Endingen, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Sep. 28, 1979, Ser. No. 80,771

Claims priority, application Switzerland, Oct. 20, 1978, 10863/78

Int. Cl.³ F16L *19/08*

U.S. Cl. 285—89 **4 Claims**



1. A screw coupling safety mechanism in combination with a first member and second member which members are to be coupled together comprising:

a first annular disk and a second annular disk, each of the disks having a plurality of teeth projecting from the periphery of the respective disk, said disks being of the same diameter, at least one of said teeth of one disk being bendable into a space between adjacent teeth of the other disk to prevent relative rotation of said disks;

first locking means for selectively locking the first annular disk against rotation relative to the first member;

second locking means for selectively locking the second annular disk against rotation relative to the second member; and

separation means for resiliently maintaining separation between the first disk and the second disk arranged on one of the disks.

4,286,808

SNAP-IN TEE CONNECTOR

James L. Fouss, and John J. Parker, both of Findlay, Ohio, assignors to Hancor, Inc., Findlay, Ohio

Filed Aug. 20, 1979, Ser. No. 67,808

Int. Cl.³ F16L *3/04*

U.S. Cl. 285—158 **15 Claims**

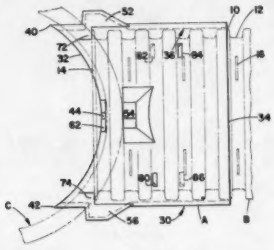
1. A connector comprising:

a sleeve having a first and a second end, said sleeve having a bore extending longitudinally between said first and second ends;

said first end being cylindrical and having a configuration which is generally circular around its periphery and having two generally arcuate longtitudinal recesses separated by two generally arcuate longitudinal protuberances, each

arcuate recess having an apex at its maximum longitudinal recession and each arcuate protuberance having an apex at its maximum longitudinal protrusion, the first end is adapted to be received in a circular aperture which is commensurate in size and shape with the circular periphery cut into an arcuate side wall of a corrugated conduit with the longitudinal recesses and protuberances conforming generally with the interior surface of the conduit;

a first circumferentially discontinuous projection projecting radially outward from the periphery of said first end, said first projection being disposed generally contiguous with the apex of one of the arcuate protuberances, such that the projection limits penetration into the aperture and causes



an outward axial cammin force under rotational forces in either rotational direction;

a first tab means projecting radially outward from the periphery of the first end which is adapted to pass yieldingly through the aperture and engage the interior surface, said first tabe means being disposed generally contiguous with the apex of one of said recesses, such that the tab means inhibits removal from an aperture and causes an inward axial force under rotational forces in either rotational direction, whereby under rotational forces the projection and tab means cause opposite axial forces; and

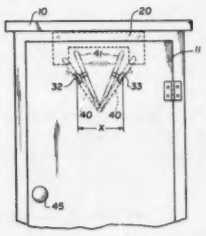
a detent projecting from said sleeve, such that the connector is adapted to receive telescopically and the detent to engage an end of a length of corrugated conduit.

4,286,809

CHILD-PROOF CABINET CLOSURES

Richard H. Godwin, 18 Osborne Rd., Garden City, N.Y. 11535

Filed Jun. 8, 1979, Ser. No. 46,862
Int. Cl.³ E05C *3/14*
U.S. Cl. 292—54 **2 Claims**



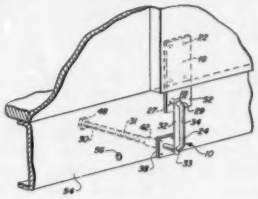
1. A child-resistant fastening system for securing a standard door member in closed position over the opening of an associated cabinet comprising: first and second elongated latch means on the inner surface of said door; a single catch means within said cabinet in proximity to one end of each said first and second latch means; each said latch means being pivoted about a common axis at the end remote from engagement with said catch means; common biasing means for holding said latch means into engagement with said catch means when said door is closed; a release means fixed to each latch means between said axis and said one end, each being connected to one of said latch means and extending to the outer surface of said door, said release means being separated by a distance greater than a child's hand span but less than an adult's hand span and being manually operative to overcome said biasing means and effect disengagement of each said latch means from said catch means; and additional means securing said door member in closed position, said additional means being disposed more than one hand span from either of said release means and being manually operative to open said door only when each of said release means are disengaged.

4,286,810

MANUALLY OPERABLE LATCHING DEVICE

Thomas J. Ehmen, 1200 W. 8th Ave., Milan, Ill. 61264

Filed Jun. 5, 1979, Ser. No. 45,601
Int. Cl.³ E05C *1/04*
U.S. Cl. 292—67 **1 Claim**



1. A manually operable latching device for use on a vehicle having a movable cargo door for safely securing said door in an open position comprising:

a latch plate secured to said movable door, said latch plate having a cantilevered portion extending beyond said movable door and said cantilevered portion having an aperture; and

a pinning assembly capable of withstanding shearing forces applied transverse to its longitudinal axis, said pinning assembly secured to said vehicle at a location to facilitate the latching of said pinning assembly with said aperture of said latch plate when said movable door is in an open position, and to facilitate concealment of portions of said pinning assembly to reduce the extent of protuding portions thereof and comprising:

a U-shaped rod having an intermediate segment, a first end segment and a second end segment, said second end segment having threads, said intermediate segment being substantially normal to said first and second end segments and said intermediate segment serving as a handle enabling said first end segment to engage and disengage from said latch plate;

a sleeve, secured to said vehicle, accepting said second end segment of said rod in longitudinal sliding engagement and to restrict the movement of said rod to displacement substantially perpendicular to the plane of said movable door and to rotation about the longitudinal axis of the sleeve;

a compression means connected to said rod for preventing movement of said rod relative to said sleeve until said rod is manually displaced for engaging or disengaging from said latch plate;

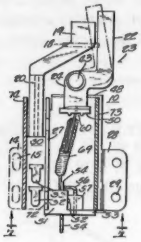
a nut engaging said threaded second end segment, said nut being movable along said threaded second end segment for adjusting the compressive force of said compression means; and,

a safety stop means fixed to at least one of said end segments and in spaced relationship to said intermediate segment for limiting the perpendicular displacement of said U-shaped rod and for providing an offset between said safety stop means and said intermediate segment.

4,286,811
BIMETAL ACTUATED LOCKING DEVICE

Spencer C. Schantz, 5880 Anchorage Rd., Oconomowoc, Wis. 53066

Division of Ser. No. 886,986, Mar. 15, 1978, Pat. No. 4,179,907. This application Aug. 8, 1979, Ser. No. 64,928
Int. Cl.[3] E05C *13/10*
U.S. Cl. 292—201 3 Claims



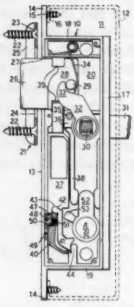
1. A safety interlock device comprising a base, a locking lever and pivot means pivotally connecting said locking lever to said base, an insulative coupling fixed to one end of said locking lever, an insulative support block spaced from said pivotal connection of the locking lever, a bimetal element cantilevered from said insulative support block and extending between said support block and said insulative coupling, and cooperating means on said bimetal and said coupling to connect said bimetal to said locking lever to afford rotary displacement of said lever about said pivot upon thermal action of said bimetal and to afford relative movement of the adjacent end of said bimetal relative to said coupling, and wherein said base has two planar wall elements joined at right angles to form an L-shaped support member, a cover member comprised of substantially planar wall elements joined with each other to form a generally U-shaped cover member for engaging with said L-shaped support member in complementary fashion, one of said wall elements of said U-shaped cover member having projections on its edge and the other of said wall elements of said cover having slots corresponding with said projections, one of said wall elements of said L-shaped support member having projections on its edge and the other of said wall elements having slots corresponding with said projections, the projections on one of said members engaging in the slots of the other of said members to secure them together in complementary fashion, said support member having a portion bent to form a foot for securing said support member to an appliance, said cover member having a portion bent to form a foot for securing said cover to the appliance.

4,286,812
SECURITY SCREEN DOOR LOCK

Otto G. G. Sprekeler, Tarragindi, Australia, assignor to Whitco Pty. Ltd., Sherwood, Australia

Filed Oct. 19, 1979, Ser. No. 86,311
Claims priority, application Australia, Oct. 16, 1979, 51837/79
Int. Cl.[3] E05C *1/16*
U.S. Cl. 292—245 8 Claims

1. A lock including:
a body;
a lock tongue normally extending from the body, said tongue being provided with means projecting from each side thereof to adapt said tongue to reversibility for use with both left and right hand opening doors;
means for retaining said tongue in its selected, reversible position;
a locking block slidably movable in the body between a first position free of the lock tongue and a second position preventing retraction of the lock tongue;
an abutment in the body; and
a stop lever movably mounted on the locking block and

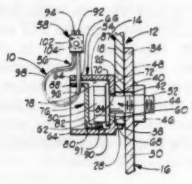


adapted to engage the abutment when the locking body is in the second position to restrain the locking body in the second position.

4,286,813
SECURITY LOCKING ASSEMBLY

William H. Wylie, Oklahoma City, Okla., assignor to Metalfab Industries, Inc., Oklahoma City, Okla.

Filed Aug. 13, 1979, Ser. No. 65,929
Int. Cl.[3] E05C *13/02*
U.S. Cl. 292—251 13 Claims



1. An improved security locking assembly for substantially preventing unauthorized removal of a bolt having a bolthead, the bolt operably engaging a security member for joining two members together, the two members being characterized as a first and second housing wherein one of the housing telescopically receives a portion of the other housing such that one edge portion of the housing telescopically receiving the other housing forms a ridge, each of the first and second housing having an aperture therein such that in a connected position the apertures are aligned for receiving the bolt, the security locking assembly comprising:
a locking assembly housing secured to the first and second housing by the bolt and the securing member such that the bolthead is disposed substantially adjacent one surface of the locking assembly housing, the locking assembly housing comprising:
a base plate having a first side, and opposed second side, and an aperture;
wall means having at least one aperture therein, the wall means extending outwardly from the first side of the base plate;
an orientation member extending outwardly from the opposed second side of the base plate, the orientation member positioned a distance from the aperture of the base plate such that in the connected position the aperture of the base plate is aligned with the aperture of the first and second housing for receiving the bolt, the orientation member engaging the ridge formed by the

edge portion of the housing telescopically receiving the portion of the other housing;

a pin having a first end portion and a second end portion, the pin extending through at least a portion of the locking assembly housing when the pin is in a connected position with the locking assembly housing, the pin being shaped such that in the connected position the first end portion of the pin is disposed near the second end portion of the pin, the pin and the locking assembly housing being shaped such that a portion of one of the locking assembly housing and the pin is disposed near and above at least a portion of the bolthead to substantially prevent access to the bolthead when the pin and the locking assembly housing are in the connected position; and

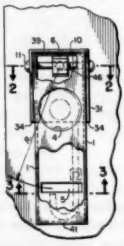
means for securing the first end portion of the pin to the second end portion of the pin to substantially prevent removal of the pin from the locking assembly housing without destruction of a portion of one of the pin and the locking assembly housing.

4,286,814

UNIVERSALLY PIVOTAL PADLOCK AND STAPLE SHIELDING HASP

Richard P. Harrington, and Russell J. Harrington, both of P.O. Box #24, Alexandria, La. 71301

Filed Oct. 11, 1977, Ser. No. 840,951
Int. Cl.³ E05C *19/08*
U.S. Cl. 292—281 **23 Claims**



1. A hasp comprising a housing formed so that a padlock may be inserted therein and shielded thereby, a means at one end of the housing for mounting said housing on a surface for pivotal movement both along said surface and away therefrom, access means through said housing for manipulation of a padlock, when inserted therein, and for reception of a staple; and a staple formed to be secured by the shackle of a padlock, when inserted into said access means, and having means for mounting the staple, for entry into said housing through said access means.

4,286,815

LENS INSERTION AND REMOVAL DEVICE

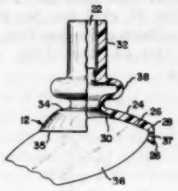
James A. Clark, Honeoye Falls, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation-in-part of Ser. No. 915,842, Jun. 15, 1978, abandoned. This application Dec. 28, 1979, Ser. No. 108,209
Int. Cl.³ A61F *9/00*
U.S. Cl. 294—1 CA **7 Claims**

6. A device for inserting into and removing from an eye a soft contact lens comprising:

a suction cup having an extension projecting outwardly therefrom for engaging a soft contact lens, said extension being adapted to extend to the edge of the contact lens and having a spiralled passage formed therein for communicating air from outside a soft contact lens to a chamber formed between said suction cup and the soft contact lens; and

vacuum means for applying a vacuum to the chamber between said suction cup and the soft contact lens whereby when a vacuum is applied therebetween the edge of the lens is initially lifted from the eye breaking the surface



tension between the lens and the eye enabling the lens to be removed thereafter from the eye.

4,286,816

DEVICE FOR COLLECTION AND DISPOSAL OF PET WASTE

Emil Tobias, 42 Greenwood La., White Plains, N.Y. 10607

Filed Jun. 23, 1980, Ser. No. 161,939
Int. Cl.³ A01K *29/00*
U.S. Cl. 294—1 BA **2 Claims**

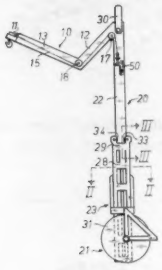
1. A device for the collection and disposal of fecal waste comprising an outer cylindrical body having an outer end thereof open and an inner closed end, an inner cylindrical body having one end thereof open and one end thereof closed, said inner cylindrical body being positioned within said outer cylindrical body, means for moving said inner cylindrical body longitudinally with respect to said outer cylindrical body, means normally biasing said inner cylindrical body towards the closed end of said outer cylindrical body, a first annular ring having an inwardly extending lip engaging the open end of said inner cylindrical body and an outwardly extending lip engaging the outer end of said outer cylindrical body, a second annular ring having an outer diameter substantially the same as the inner diameter of said first annular ring and an outwardly extending lip adapted to engage an outer edge of said first annular ring, and a grid network of ribs in said second annular ring; and a plastic bag extending into the interior of said inner cylindrical body and between said first and second rings, downwwardly facing ends of said ribs forming knife edges and said ribs having walls flaring outwardly to a wide flat top surface.

4,286,817

HOISTING ACCESSORY

Kjell F. Moritz, Skördevägen 52, S-230 52 Skanör, Sweden

Filed Dec. 17, 1979, Ser. No. 104,631
Claims priority, application Sweden, Dec. 21, 1978, 7813163
Int. Cl.³ B66C *1/10*
U.S. Cl. 294—67 AA **12 Claims**



1. A hoisting accessory for use with a hoisting device for placing a load through openings in walls or the like, comprising:

a support arm, having an essentially horizontal portion, an integral essentially vertical portion, and a lift yoke between its ends for connecting to said hoisting device, said horizontal portion including a downwardly inclined portion and an upwardly inclined end portion;

a load coupling unit arranged at the outer end of said horizontal portion for carrying a load;

a counterweight unit arranged at said vertical portion displaceable between an upper retracted position and a lower extended position; and

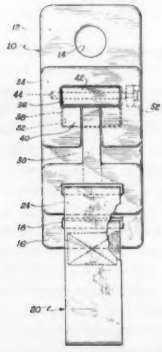
a locking device for locking the counterweight unit in said retracted position and, when the load connected to the load coupling unit exceeds a predetermined weight, releasing said counterweight unit for displacement to said extended position under the influence of gravity.

4,286,818

PURSE SEINE RING TIE

Dominick J. Flammini, 7946 Laurelridge Rd., San Diego, Calif. 92120

Filed Dec. 26, 1979, Ser. No. 107,098
Int. Cl.³ B66C *1/12*
U.S. Cl. 294—77 **4 Claims**



1. A ring tie for releasibly attaching pursing rings to a seine net, comprising:

(a) a body member having means for substantially permanent attachment to a seine net;

(b) a clasp member with releasible connector means comprising a receptor in said body member, a portion of said clasp slidably received in said receptor, and a removable holder retaining said portion in said receptor, whereby the clasp member is substantially permanently connected to said body member for regular operation yet capable of easy disconnection for purposes of maintenance and replacement;

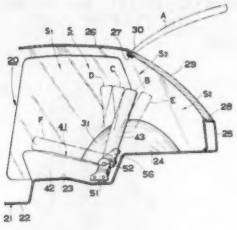
(c) a short strap shackle secured to and between said members and depending therefrom, in the manner of a shackle of an inverted padlock, for connection onto a pursing ring, and said said strap shackle being scissile to permit intentional cutting thereof in emergencies during use.

4,286,819

REAR SEAT FOR CARS

Haruo Inoue, Tokyo; Shigeru Yokota, Fujimi, and Yoshiharu Saito, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 7, 1978, Ser. No. 958,405
Claims priority, application Japan, Nov. 7, 1977, 52-149267; Nov. 14, 1977, 52-152524; Nov. 14, 1977, 52-152525
Int. Cl.³ B60N *1/02*
U.S. Cl. 296—65 R **8 Claims**



1. A rear seat apparatus for a car of the hatch-back type having a tail gate door arranged at an angle with respect to a vertical plane, said door being pivotally supported by and extending substantially rearwardly downwardly from a rear end portion of the roof panel of the car, comprising:

a rear seat back which normally substantially sections a sitting space and a luggage space of said car, which spaces communicate with each other;

said rear seat back being normally disposed such that said luggage space of said car is substantially triangular in vertical cross-section, said luggage space being defined substantially between said rear seat back, sa.. tail gate door, and a rear floor portion of said car;

said rear seat back is normally substantially aligned with a line extending from said rear end portion of said roof panel of said car;

said rear seat back being provided with reclining means for adjusting the rising angle of said seat back so as to vary the capacity of said luggage space of said car;

said rear seat back being provided with means for operating said reclining means, said operating means being disposed in the upper central part on the back surface of said rear seat back;

right and left control cables disposed within said rear seat back, said control cables being operable by said operating means to lock and release said reclining means;

said operating means comprising a lever provided with receiving parts; and

said apparatus further including:

engaging members provided at tip ends of said control cables, said engaging members being adapted to be received by said receiving parts;

a part to be pulled by the fingers of a user of said appara-

tus, said pulling part being integrally provided with said receiving parts; and

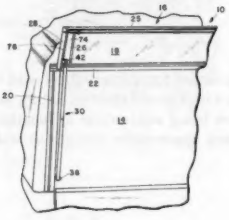
bracket means pivotably supporting said lever and provided integrally with means for holding said control cables.

4,286,820

TRUCK COVER AND DOOR THEREFOR

Donald C. McGaughey, Bristol, Ind., assignor to State Wide Aluminum of Indiana, Inc., Elkhart, Ind.

Filed Jul. 5, 1979, Ser. No. 54,840
Int. Cl.³ B60P *3/00*
U.S. Cl. 296—146 **15 Claims**



1. In a truck top cover for use on a vehicle having a rear access opening formed by a frame and a door, said door having opposed faces and edges, said edges extending peripherally between said faces, said door being hingedly mounted to said frame along one edge and swingable between open and closed positions relative to the frame, a telescopic prop member to hold said door in said open position whether the vehicle is moving or at rest, and means mounting the prop to said door;

said mounting means including a bracket member pivotally mounted to said prop and

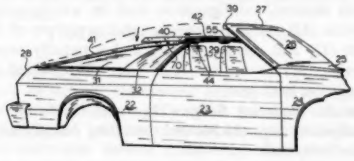
including means defining first and second mounting surfaces positioned substantially at right angles with respect to each other, said first surface being adapted for rigid attachment to one of said faces of said door and said second surface being adapted for rigid attachment to one of said other edges of said door whereby said door is held in a relatively rigid manner in said open position and resists jarring and vibratory forces acting in a direction substantially parallel with the axis of the hinge of said door such that said door is held sufficiently rigid even though the vehicle is in motion.

4,286,821

AUTOMOBILE BODY WITH A RETRACTABLE HARD TOP ROOF

Herbert Cooper, 1 Tom's Point La., Port Washington, N.Y. 11050

Filed Mar. 26, 1980, Ser. No. 134,047
Int. Cl.³ B60J *7/16*
U.S. Cl. 296—216 **6 Claims**



1. An automobile body of the type having a front windshield and a passenger compartment which includes a pair of body side panels between which is disposed a front seat section and a rear seat section, the improvement comprising:

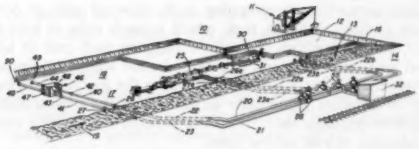
a collapsible, segmented convertible hard top roof mounted for movement between a raised, non-collapsed position, in which said roof extends from an upper edge of said front windshield rearwardly over said front and rear sections of said passenger compartment at a sufficient height so that said body assumes the general configuration of a hard top four passenger sedan body, and a lowered collapsed position, in which said roof extends substantially over only the rear seat section of said passenger compartment at a lower height such that it lies substantially flush with the upper edges of said body side panels so that said body assumes the general configuration of a two-passenger open top roadster, said roof having a front panel and a rear panel which, when said roof is disposed in said raised, non-collapsed position, extends over said front seat section and said rear seat section, respectively, said roof also including means for pivotably mounting said rear panel along a rear edge thereof to a rear portion of said body so as to permit movement thereof between said raised and collapsed positions relative to said rear seat section and means for coupling said front panel to said rear panel for movement between said raised, non-collapsed position in which said front panel lies between said rear panel and said front windshield, and said lower, collapsed position, in which said front panel is slid upwardly and rearwardly such that it is superimposed over said rear panel so as to uncover said front seat section, said roof also including a pair of rear, side window panels disposed on opposite sides of said roof rear panel along one of said body side panels and means for pivotably mounting said rear, side window panels along a lower edge thereof to the associated body side panel for movement between said raised, non-collapsed position, in which said rear, side window panels assume a generally vertical disposition for supporting said rear panel and a lowered collapsed position, in which said rear side window panels are pivoted inwardly towards the interior of said body so that they assume a generally horizontal disposition and lie substantially flush with the upper edge of said body side panels.

4,286,822

UNDERSPOIL SLURRY HAULAGE

Richard E. Doerr, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Dec. 14, 1979, Ser. No. 103,319
Int. Cl.³ E21C *35/20, 41/00*
U.S. Cl. 299—18 **3 Claims**



1. A method for underspoil haulage of mineral product from a surface mine wherein the top soil is removed which is covering the mineral layer and the area is continuously reclaimed over the mined out area comprising:

(a) removing a strip of overburden exposing the mineral layer thereunder;

(b) laying a first pair of pipes from the bottom of said mineral layer to a processing location;

(c) connecting a source of fluid to one of said pipes and a slurry processing system at said processing location to said remaining pipe;

(d) connecting a mobile slurry haulage system including a crusher and slurrying means to the termination of the pair of pipes at the bottom of said mineral layer;

(e) removing said mineral and depositing said mineral into

said crusher and slurrying means to the maximum extent of said mobile slurry haulage system;

(f) laying a subsequent pair of pipes in the same manner as said first pair of pipes and reconnecting said slurry haulage system in the same manner as said first system;

(g) extending said first pair of pipes across the mined out strip;

(h) redepositing said strip of removed overburden over said mined out area including said first pair of pipes; and

(j) repeating said steps to the end of said removed overburden.

4,286,823

CONVEYOR AND GUIDE ASSEMBLY

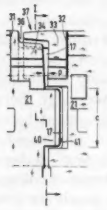
Gerhard Merten, Lunen; Wolfgang Peters, Selm; Hans-Dieter Schneider, Lunen, and Willy Heyer, Bochum-Gerthe, all of, Fed. Rep. of Germany assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Mar. 6, 1980, Ser. No. 127,716

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1979, 2908827

Int. Cl.[3] **E21C** *35/12*

U.S. Cl. 299—43 **12 Claims**



1. In a conveyor and guide assembly comprising a conveyor and a plough guide attached to one side of the conveyor, the conveyor comprising a plurality of conveyor sections joined end-to-end, and the guide comprising a plurality of guide sections positioned end-to-end, each guide section being associated with, and extending substantially along, a corresponding conveyor section, the guide having a generally L-shaped guide plate and a ramp-like cover plate which define therebetween upper and lower chain ducts for receiving a plough drive chain, each cover plate section being curved over at the top towards the corresponding guide plate section thereby delimiting the upper portion of the upper chain duct, the improvements comprising overlapping each adjacent pair of cover plate sections in a first zone which extends over at least the curved-over portions thereof, overlapping each pair of adjacent guide plate sections in a second zone which adjoins said first zone, and longitudinally off-setting the gap between each pair of adjacent guide plate sections from the corresponding gap between adjacent conveyor sections in a third zone which is adjacent to said second zone.

4,286,824

WHEEL WITH REPLACEMENT SPOKES

Raymond C. Brown, Tarzana, Calif., assignor to Superior Industries International, Inc., Van Nuys, Calif.

Filed Dec. 21, 1979, Ser. No. 105,920

Int. Cl.[3] **B60B** *7/00*

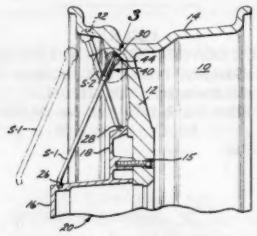
U.S. Cl. 301—37 SS **7 Claims**

1. In a vehicle wheel construction having a solid wheel that includes a radially extending bolt-on flange which merges into a tire-receiving rim;

a plurality of replaceable spokes extending between radially inner and outer points on said wheel;

a mounting member carried by each of said spokes that is longitudinally slidable relative to its respective spoke; and

spring means interposed between each spoke and its mounting member biasing such spoke and its mounting member longitudinally apart, with said spokes being releasably retained in place between said inner and outer points by



the compressive force exerted by said spring means between such spokes and their mounting members, and with said spokes being ornamental in function in that they do not lend any appreciable strength to said wheel.

4,286,825

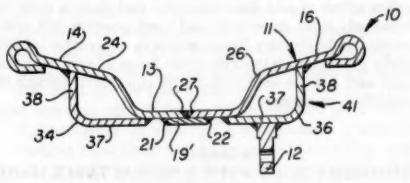
FABRICATED HEAVY-DUTY INDUSTRIAL WHEEL

Alfred W. Sieving, Venedy, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 7, 1980, Ser. No. 110,069

Int. Cl.[3] **B60B** *3/02, 21/00*

U.S. Cl. 301—63 R **5 Claims**



1. In a fabricated heavy-duty industrial wheel (**10**) of the type having a drop center rim (**11**), said rim (**11**) having a rim well (**13**) and a pair of bead seats (**14,16**) positioned on opposite sides of the rim well, the improvement comprising:

a pair of reinforcing rings (**34,36**) each having an L-shaped cross sectional configuration with an axially extending portion (**37**) extending into the inner periphery of the rim well (**13**) and welded thereto and a radially extending portion (**38**) having its outer edge (**39**) welded to the respective bead seat;

an annular mounting flange (**12**) connected to one of the reinforcing rings (**34,36**) and extending radially inwardly therefrom; and

wherein said rim (**11**) is constructed from a backup ring (**19**) and a pair of identical halves (**24,26**) seated on said backup ring (**19**), the halves having inner ends (**27**) welded to each other and to the backup ring (**19**), said backup ring (**19**) having its outer ends (**21,22**) welded to the rim well (**13**) of the rim (**11**).

4,286,826
BRAKE BOOSTER FOR THE ANTI-WHEEL LOCKING OF A MOTOR VEHICLE BRAKE SYSTEM

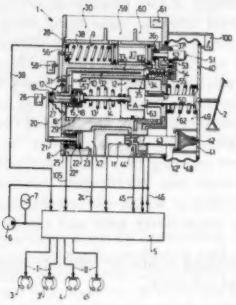
Heinz Leiber, Leimen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 870,784, Jan. 19, 1978, abandoned. This application Mar. 25, 1980, Ser. No. 133,725

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1977, 2702819

Int. Cl.³ B60T *8/02*

U.S. Cl. 303—114 **31 Claims**



1. A brake booster for the anti-wheel locking of a motor vehicle brake system having brake pedal actuation and two hydraulic integral brake circuits, the booster comprising:

a housing within which a booster cylinder is defined;

a booster piston mounted for displacement within the booster cylinder;

a pressure medium supply bore connected to the booster cylinder;

a pressure medium return bore connected to the booster cylinder, both bores forming part of one of the two brake circuits;

a control valve mounted to the housing for controlling the pressure medium flow in the supply and return bores;

connecting means for connection to the brake pedal;

a travel limiting spring located between the control valve and the connecting means for transmitting brake pedal forces to the control valve;

a reservoir;

an auxiliary piston mounted for displacement within the reservoir under the influence of a pressure medium within the reservoir; and

force transmitting means connecting the booster piston and the auxiliary piston, for displacing the booster piston to a predetermined position which allows the brake pedal to execute an idle stroke relative to the booster piston.

4,286,827
CYLINDRICAL ELASTOMERIC BEARING

Robert R. Peterson, Hudson, and Daniel S. Ventura, Malden, both of Mass., assignors to Barry Wright Corporation, Watertown, Mass.

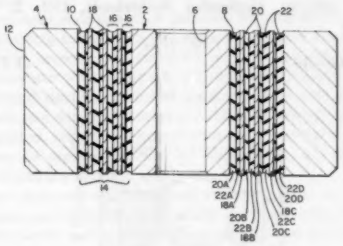
Filed Oct. 11, 1979, Ser. No. 83,598

Int. Cl.³ F16C *27/06*

U.S. Cl. 308—26 **11 Claims**

1. In a cylindrical elastomeric bearing comprising a rigid interior member and a rigid exterior member, wherein said interior and said exterior members are joined together by bonded concentric laminae comprising alternating strata of resilient material and non-extensible material disposed one about the other around a common axis,

the improvement wherein at least some of said resilient strata are formed from two or more bonded cylindrical and concentric substrata disposed about each other and around said common axis, with each substratum within a given resilient stratum comprising a resilient material having a shear modulus of elasticity different from the shear modulus of elasticity of every other substratum within said resilient stratum, and the shear moduli of elasticity of the substrata in each resilient stratum being



selected so that the said resilient strata have effective shear moduli of elasticity such that the torsional shear strains established within each resilient stratum are substantially the same as the strains established within every other resilient stratum for a given range of torsional loads.

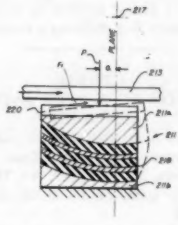
4,286,828
OFFSET-PAD BEARING

Nathan T. Sides, Annapolis, and Thomas L. Daugherty, Arnold, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 28, 1979, Ser. No. 98,276

Int. Cl.³ F16C *27/02*

U.S. Cl. 308—26 **1 Claim**



1. A bearing pad for supporting a relatively movable load applying member through a film of lubricating liquid comprising:

a base member;

a face member supported on the base member and including a bearing surface entirely thereover facing the movable member for slidably carrying the load thereof;

means fixedly connecting the face and base members but permitting swinging movement of the face member relative to the base member on a radius having an axis disposed out of the pad and on the opposite side of the bearing surface;

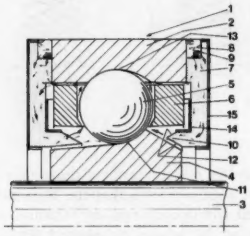
both said face member and said base member being substantially offset laterally from the nadir of the base member to the upstream side thereof;

whereby the load of the movable member on the bearing surface and frictional drag of the movable member moving across the bearing surface both causes the face member to swing about its axis and tilt the bearing surface so that a leading edge thereof is displaced from the movable member for collecting a wedge-shaped film of lubricating liquid therebetween upon movement of the movable member thereacross.

4,286,829
BEARING FOR HIGH ROTATIONAL SPEEDS

Rutgerus S. Heemskerk, Vianen, Netherlands, assignor to SKF Industrial Trading & Development Co. B. V., Nieuwegein, Netherlands

Filed Sep. 28, 1979, Ser. No. 79,837
Claims priority, application Netherlands, Oct. 2, 1978, 7809912
Int. Cl.³ F16C *1/24, 33/78*
U.S. Cl. 308—187 **11 Claims**

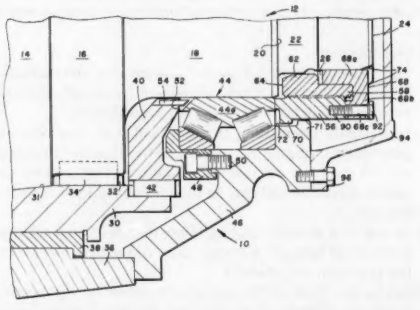


1. A bearing for high rotational speeds, comprising a stationary and a rotatable race ring, a plurality of rolling elements in the annular space between the rings, a cage for spacing the rolling elements, and a lubricating system to supply lubricant to the raceways of the bearing, characterized by a ring made of a porous material fixed in at least one end part of said stationary ring adjoined by a source of lubricant, a part of said ring of porous material extending into the vicinity of the running surface of the rotating raceway such that the lubricant, under the influence of negative pressure generated by high rotation, is drawn out from said end part and moved from said part in a direction to the said stationary race ring and returned to the porous ring once more on the running surfaces of said stationary race ring, and a recess formed in the porous ring and adjoining the stationary race defining a reservoir for lubricant.

4,286,830
COMBINATION ROLL NECK AND BEARING ASSEMBLY

Lowell S. Salter, Jr., Shrewsbury, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Sep. 24, 1979, Ser. No. 78,457
Int. Cl.³ F16C *19/38, 35/06, 43/04*
U.S. Cl. 308—207 R **11 Claims**



1. In a rolling mill, the combination of a roll having a roll neck rotatably supported in a bearing assembly which includes as an integral component a force exerting means consisting of a nut threaded on a ring, the ring being detachably mounted in a non-rotatable axially confined position on the roll neck, and the nut being engageable with other bearing components and being rotatable relative to the ring to axially force the bearing assembly into and out of its operative position on the roll neck, the improvement comprising:

a circular external groove in the roll neck at a location spaced inwardly from the end thereof;

a plurality of external ribs on the roll neck extending axially from the roll end to said external groove, said external ribs being separated by external slots in the roll neck;

a plurality of internal ribs extending axially along the interior of said ring, said internal ribs being separated by axially extending internal slots in said ring;

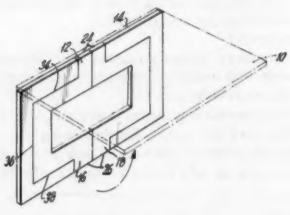
the arrangement of said external groove and said internal and external ribs and slots being such that when said external ribs and slots are in axial alignment respectively with said internal slots and ribs, said bearing assembly is movable axially relative to the roll neck between an inoperative position removed from the roll neck and an intermediate position at which the internal ribs of said ring are located within the external groove on said roll neck, whereupon said ring may be rotated relative to said roll neck between said intermediate position and an interlocked position at which said internal ribs and slots are in alignment respectively with said external ribs and slots; and,

detachable locking means for rotatably fixing said ring relative to said roll neck.

4,286,831
FOLDING FURNITURE

Robert E. Beers, 20 Georgian Rd., Morristown, N.J. 07960

Continuation of Ser. No. 17,850, Mar. 6, 1979. This application Oct. 15, 1980, Ser. No. 197,175
Int. Cl.³ A47B *43/00*
U.S. Cl. 312—258 **3 Claims**



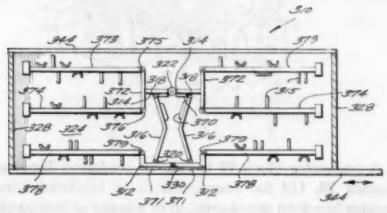
1. A piece of folding furniture comprising two planar members hinged about contiguous edges thereof, one of said members being suitable as a horizontal surface for a piece of furniture, the second said planar member being formed to define two generally C-shaped support elements hingedly attached to said second member and movable from the plane of said second member to a position supporting said first planar member in a horizontal posture, said two support elements being hingedly attached for movement away from the central area beneath said horizontal surface to define an open space for receiving the legs of a person sitting at said piece of folding furniture, at least one of said generally C-shaped support elements being formed to removably receive a file/drawer member, said file/drawer member being formed with means for slidingly removable, mounting engagement within the C-shaped structure of said at least one of said generally C-shaped support elements.

4,286,832

ARTICLE SUPPORTING ASSEMBLY

Stephen T. Spevak, Potomac, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.

Continuation-in-part of Ser. No. 907,321, May 18, 1978, Pat. No. 4,170,392. This application May 14, 1979, Ser. No. 38,719
The portion of the term of this patent subsequent to Oct. 9, 1996, has been disclaimed.
Int. Cl.³ A47B 97/00, 81/00
U.S. Cl. 312—283 23 Claims



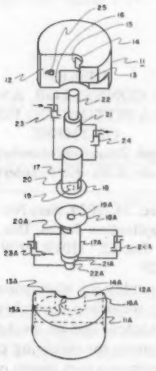
1. An article supporting assembly comprising a base member; a center structure; means for mounting said center structure for rotation with respect to said base member about an axis perpendicular to said base member; at least two cover plates; article supporting structures formed on at least one of the center structure and the cover plates; at least two spanners; first hinges for connecting the cover plates to the spanners so that the cover plates are pivotal with respect to the spanners; and second hinges for connecting the spanners to the center structure so that the spanners are pivotal with respect to the center structure.

4,286,833

METHOD AND APPARATUS TO FABRICATE IMAGE INTENSIFIER TUBES

E. V. Patrick, Lorton; Howard K. Dickson, Alexandria, and Howard L. Dunmire, Stafford, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 930,264, Aug. 2, 1978, abandoned. This application Nov. 30, 1979, Ser. No. 99,056
Int. Cl.³ H01J 9/18, 9/46
U.S. Cl. 316—31 9 Claims



1. An apparatus for fabricating image intensifier tubes and the like, each having at least an anode and a cathode subassembly which are pressed together in a vacuum to form a complete tube, comprising:

first and second generally cylindrical vacuum chambers each large enough to contain a large plurality of said tubes and each having central and radially displaced access ports in at least one circular end wall adapted to receive tube formation, testing and storing devices;

a vacuum lock cylinder structure interconnecting said chambers and having first and second portals at opposite ends thereof, each opening into a different one of said chambers;

a transverse wall structure common to both said chambers separating said portals and defining a center aperture;

first and second ram members on opposite sides of said transverse wall structure, moveable only along an axis through said aperture and normal to said wall structure, each ram adapted to receive a different one of said subassemblies, whereby a complementary set of subassemblies may be pressed together to form a tube and the latter transported through said aperture;

a gate means surrounding and vacuum sealed to said ram means and independently axially moveable relative to said transverse wall structure alternately to seal and open said aperture; and

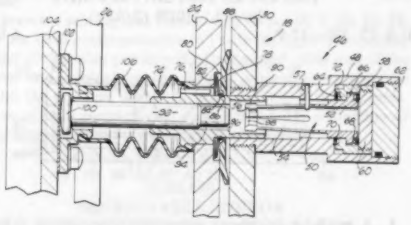
drive means coupled between an external surface of said circular end wall of said chambers, said gate means and said ram member to produce said relative axial movement therebetween.

4,286,834

INTERCONNECTION SYSTEM

David S. Goodman, Mission Viejo; Gerald J. Selvin, Huntington Beach, both of Calif.; Edward G. Dubell, Phoenix, Ariz.; Donald J. Doty, El Toro, Calif.; Alfred R. Erbe, Phoenix, Ariz., and Robert E. Wilson, Ventura, Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 13, 1979, Ser. No. 93,303
Int. Cl.³ H01R 13/629
U.S. Cl. 339—16 R 4 Claims



1. An interconnection system for coupling electrical and fluid conductors carried, for example, by an aircraft and a pylon therefor comprising:

a first mounting plate adapted to be fixedly connected to an aircraft and carrying at least one electrical connector member and fluid coupling element;

a mounting plate assembly adapted to be carried by a pylon which is releasably mounted on the aircraft over said first mounting plate, said assembly including a front plate and a rear mounting plate, said rear plate being movable from a rear position to a forward position closer to said front plate;

said front plate carrying at least one electrical connector member and fluid coupling element arranged to mate with the electrical connector member and fluid coupling element on said first mounting plate;

means biasing said rear plate toward said rear position;

said rear plate being adapted to be fixed to the pylon whereby, when the pylon is being moved forwardly for attachment to the aircraft, during an initial stage of movement of the pylon, and hence the rear plate, the electrical connector member and fluid coupling element on said

front mounting plate will mate with the electrical connector member and fluid coupling element on said first mounting plate and, during a second further stage of movement, said rear plate will reach said forward position;

rapidly releasable positive retaining means for said first mounting plate and said mounting plate assembly for locking said electrical connector members and fluid coupling elements in mated relationship against the separating force of high differential pressures which may exist between said fluid coupling elements;

said retaining means comprising a catch carried by said front plate, a lock member on said rear plate and a spring lock element fixed to said first mounting plate, said spring lock element being normally biased to a release position with respect to said catch; and

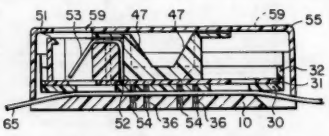
during said initial stage of movement of the pylon toward the aircraft, said catch moving to an overlapping, but spaced apart position relative to said lock element, and during said second stage of movement, said lock member moving forwardly relative to said front plate and said lock element to shift said lock element into locking position with said catch.

4,286,835

MODULAR TELEPHONE CONNECTOR

William J. Adams, Franklin; Jeffrey W. Moorse, Antioch, both of Tenn., and Steve W. Haskins, Corinth, Miss., assignors to Northern Telecom Inc., Ottawa, Canada

Filed Jul. 22, 1980, Ser. No. 171,178
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—17 F **6 Claims**



1. A modular telephone connector comprising a bottom member, a top assembly and a cover;

said top assembly comprising a base;

a recess in an upper surface of said base;

an insert positioned in said recess and carrying circuit patterns on at least one surface thereof;

a top member attached to the base;

at least one modular jack positioned in an aperture in said top member and retained therein, the jack including terminals passing into holes in said insert and connected to said circuit patterns;

and insulation piercing terminals positioned in apertures in said base and extending downward therefrom, the insulation piercing terminals including tail portions extending into holes in said insert and connected to said circuit patterns;

said bottom member including recesses into which said insulation piercing terminals enter, the arrangement being such that a flat cable is gripped between said bottom member and said base of said top assembly and said insulation piercing terminals pierce the cable and make electrical contact with conductors in said cable;

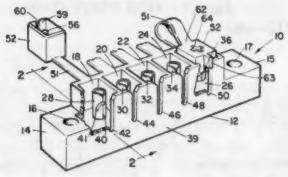
said cover including means for retaining said cover on said bottom member and top assembly.

4,286,836

CONNECTOR BLOCK WITH STRAIN PREVENTION

Norbert A. Rumps, Norridge, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Jul. 17, 1979, Ser. No. 58,239
Int. Cl.³ H01R *4/24*
U.S. Cl. 339—97 R **7 Claims**



1. A connector block **10** having an insulation displacement connector **28**, **114** for connection to an insulated wire, the connector block **10** is constructed of a material having electrical insulating properties and includes a body **12**, **72** having an open first cavity **18**, **94** with said connector **28** securely mounted therein, at least a first wall defining said first cavity has an elongated first slot **42**, **224** extending from the opening of said first cavity toward the base of said first cavity, the width of said first slot being less than the minimum diameter of the insulated wire for which the connector block **12**, **72** is to be used, characterized in that:

a cap defining a projecting member **56**, **230** located within said second cavity, said projecting member **52** having a second cavity is attached to said block by a tether **51**, said cap being shaped to engage a wire positioned adjacent said connector **28** and to force the wire into said connector so as to complete an electrical connection to the conductor of a wire,

said cap **52** includes a first wall having a second slot **60** for engaging a wire positioned adjacent said first slot **42**, **224** and forcing the wire into said first slot so that when a wire is connected to said connector and forced into said first slot, strain on the conductor of said wire at the connection will be prevented.

4,286,837

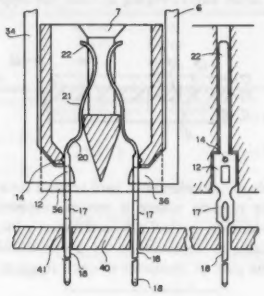
ELECTRICAL CONNECTOR, AN INSULATOR THEREFOR AND A FITTING JIG FOR AN ASSEMBLY OF THESE

Kenichi Yasutake, and Tetsuji Watanabe, both of Yokohama, Japan, assignors to K.K. Elco International, Yokohama, Japan

Filed Dec. 14, 1979, Ser. No. 103,610
Claims priority, application Japan, Dec. 25, 1978, 53-158670
Int. Cl.³ H01R *9/09*
U.S. Cl. 339—176 MP **7 Claims**

7. A connector assembly for attachment to a printed circuit board, said assembly including a number of elongated, sheet metal electrical connectors and an insulator block; said block including a row of connector receiving channels therein each having a connector entrance end; means coacting between said connectors and said channels for securing said connectors in a generally straight path in said block; said block having a plurality of access ports each extending laterally into said block and intersecting a corresponding one of said channels along the entrance end thereof; and each of said connectors having a peripherally closed aligning and driving opening therethrough

aligned with the corresponding access port and exposed therethrough to receive a drive member for inserting the connector



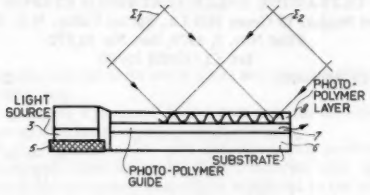
into said channel in the direction from said entrance end thereof.

4,286,838

COMPACT OPTICAL STRUCTURE WITH INTEGRATED SOURCE

Jean-Pierre Huignard; Pierre Leclerc; Jean-Claude Carballes, and Armand Nappo, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 23, 1979, Ser. No. 42,602
Claims priority, application France, May 26, 1978, 78 15794
Int. Cl.³ G02B *5/14*
U.S. Cl. 350—96.11 **13 Claims**



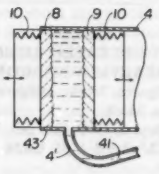
1. Compact optical structure comprising a plate comprising a substrate, an integrated laser diode fixed to said substrate having an emission face designed to emit an optical wave, a plane waveguide layer in contact with a face of said substrate, said layer being formed by a photo-polymer with an index higher than that of the underlying layer of the substrate, and an upper layer above the waveguide layer comprising photoinduced diffraction structures entirely separated from said laser diode, the emission face of the diode being arranged in such a way that the wave is guided in the waveguide layer and deflected by the diffraction structures of the upper layer.

4,286,839

LIGHT DIRECTING CONTROL SYSTEM, PARTICULARLY FOR MEDICAL OPERATING AND DIAGNOSTIC USE

Karl F. Ilzig, Hanau, and Hans Scheidemann, Maintal, both of Fed. Rep. of Germany, assignors to Original Hanau Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Dec. 12, 1979, Ser. No. 102,767
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1978, 2854684
Int. Cl.³ G02B *5/14*
U.S. Cl. 350—96.24 **15 Claims**



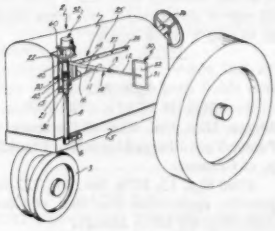
1. Light directing and control system, particularly for medical operating and diagnostic use, comprising
a hollow light guide (**4**) having an opaque, flexible tube (**40**);
a light transmitting liquid (**41**) within said tube;
light generating means (**2, 3**) positioned at one end of the tube in light transmitting relation to the liquid therein;
a light emitting terminal (**6**) located at the other end of the tube;
controllable fluid pressure generating means (**19, 20, 21, 22**) in fluid communication with the light transmitting fluid within the tube;
a fluid pressure-controllable optical system (**8, 9, 10; 11; 15, 16, 17**) in light communication with the other end of the tube;
and pressure sensing and transducing means (**8, 9, 10; 11, 18, 18'**) in fluid communication (**4'**) with the light transmitting fluid of the tube, positioned adjacent said other end of the tube and controlling the optical system in accordance with the pressure within the tube to control the transmission of light through said optical system as a function of fluid pressure in the hollow light guide.

4,286,840

RETRACTABLE MIRROR

Stanley R. Covert, 4508 Sayles Rd., Ionia, Mich. 48846

Filed Oct. 5, 1979, Ser. No. 82,291
Int. Cl.³ B60R *1/06*
U.S. Cl. 350—289 **12 Claims**



1. A retractable side view mirror for vehicles, comprising:
mirror means for reflecting an image therein;
an elongate arm having said mirror means mounted on one end thereof;
bracket means adapted for connection with said vehicle, and having the other end of said arm pivotally mounted therein for rotation along a substantially horizontal path;

said arm having an extended position for rear view by a driver of the vehicle, and a retracted position for folding said arm and mirror inwardly toward the body of the vehicle;

means for selectively rotating said arm between said extended and retracted positions;

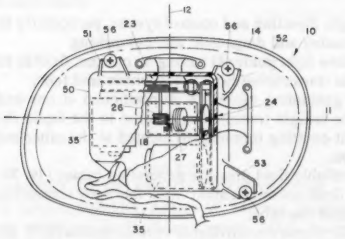
a pawl mounted on said bracket means, shaped for selective reception in a detent disposed in the other end of said arm, and including means for moving said pawl into said detent to positively lock said arm in at least one of said extended and retracted positions, and out of said detent to permit arm rotation therebetween.

4,286,841

ELECTRICALLY OPERATED REMOTE CONTROL REARVIEW MIRROR

Walter R. Deshaw, Sparta, Mich., assignor to Keeler Corporation, Grand Rapids, Mich.

Filed Sep. 6, 1979, Ser. No. 73,069
Int. Cl.³ B60R *1/06;* **G02B** *5/08*
U.S. Cl. 350—289 **43 Claims**



1. An electrically actuated rearview mirror comprising:

an X axis;

a Y axis, said X axis and said Y axis being mutually orthogonal;

a mirror;

a support for said mirror;

means for pivotally mounting said mirror on said support, said mirror being pivotable about said X and Y axes;

a spherical gear disposed on the back of said mirror, said spherical gear including an X gear section and a Y gear section, said X and Y gear sections having spherical pitch lines;

an X drive means meshing with said X gear section for pivoting said mirror about said X axis when electrical power is applied to said X drive means; and

a Y drive means meshing with said Y gear section for pivoting said mirror about said Y axis when electrical power is applied to said Y drive means.

4,286,842

SOLID STATE CIRCUIT

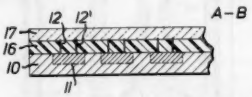
Manfred Börner, Ulm, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 13, 1976, Ser. No. 722,416
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1975, 2541003; Oct. 16, 1975, 2546272
Int. Cl.³ G02F *1/133*
U.S. Cl. 350—331 R **24 Claims**

1. In combination with a solid state circuit which has a plurality of integrated circuit elements each having at least a pair of connecting terminals, means for determining the operability of said elements, said means comprising

(a) means forming a first, insulating layer on said solid state circuit and having arranged on it the pairs of terminals of said elements, said insulating layer insulating all of the terminals from each other; and

(b) means forming at least one second layer arranged on said insulating layer and covering at least the respective pairs



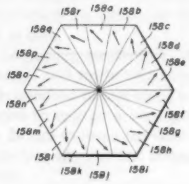
of terminals of said elements, said second layer having, at least in the regions where it covers respective pairs of element terminals, optical characteristics which are selectively variable in dependence on the potential difference between the pair of terminals of each respective element.

4,286,843

POLARISCOPE AND FILTER THEREFOR

Zinovy V. Reytblatt, 3550 N. Lake Shore Dr., Chicago, Ill. 60657

Filed May 14, 1979, Ser. No. 38,575
Int. Cl.³ G02B *5/30, 27/28*
U.S. Cl. 350—396 **29 Claims**



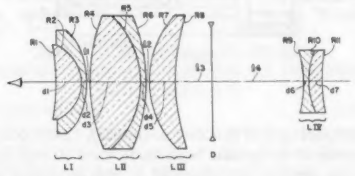
19. In a reflection polariscope for analyzing the stress in a specimen, comprising a polarizer for location adjacent to one side of the specimen and being divided into a multiplicity of sections and having a predetermined point, each of said sections including a number of elongated light polarizing elements extending radially from said point and having radial axes and inducing polarization at an angle of 45° thereto.

4,286,844

ULTRAWIDE ANGLE FLAT FIELD EYEPIECE

Albert Nagler, 15 Green Hill La., Spring Valley, N.Y. 10977

Filed Nov. 7, 1979, Ser. No. 91,972
Int. Cl.³ G02B *25/00*
U.S. Cl. 350—410 **2 Claims**



1. A wide angle eyepiece comprising four lenses, I, II, III, and IV, and a field stop D located between lens III and lens IV, wherein lens II is a bi-convex lens, lenses I and III are meniscus lenses with the strongest curve of each adjacent lens II, and lens IV is a bi-concave lens, said lenses having parameters substantially as set forth in the following table wherein lens curvatures, lens thicknesses, and lens separation distances are

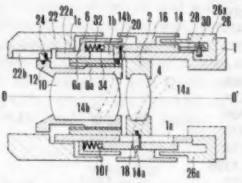
given in millimeters, n is the refractive index of a lens element, and v is the Abbe number for a lens element:

Lens	Radii	Axial Thickness "d"	Lens Separation "l"	n	v
LI	R1=−75.6	d1=8.4		n1=1.620	v1=60.3
	R2=−12.7	d2=1.5		n2=1.717	v1=29.5
	R3=−25.2		l1=0.5		
LII	R4=+52.9	d3=16.8		n3=1.620	v3=60.3
	R5=−25.2	d4=1.5		n4=1.717	v4=29.5
	R6=−52.9		l2=0.5		
LIII	R7=+29.9	d5=8.4		n5=1.620	v5=60.3
	R8=+75.6		l3=10.9		
	D		l4=29.6		
LIV	R9=−23.5	d6=1.5		n6=1.620	v6=60.3
	R10=+14.0	d7=3.8		n7=1.717	v7=29.5
	R11=+37.6				

4,286,845
ZOOM LENS BARREL CAPABLE OF CLOSE UP PHOTOGRAPHY

Shigeru Kamata, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1980, Ser. No. 134,798
Claims priority, application Japan, Apr. 6, 1979, 54-42333
Int. Cl.³ G02B 7/10
U.S. Cl. 350—430 **4 Claims**



1. A zoom lens barrel for use in zoom and close up photography, comprising:

(a) a generally cylindrical barrel part one end of which is arranged to be mounted to a camera body;

(b) optical means within said barrel part for performing zoom and close up photography, wherein said optical means has an optical axis which is parallel to the axis of said barrel part and said optical means is arranged for sliding movement relative to said barrel part in the direction of said optical axis;

(c) a generally cylindrical guide member coaxially rotatably mounted on said barrel part and having a number of guide slots for engaging said optical means and a guide edge formed on one end of said guide member, said guide member being axially movable between a first position whereat said guide slots axially move said optical means relative to said barrel part so that said optical means zooms on an object to be photographed when said guide member is rotated, and a second position whereat said guide member axially moves said optical means for close up photography of the object; (d) changeover operation means mounted on said barrel part for changing the position of said guide member for selecting one of zoom and close up photography to be performed by said optical means, said changeover operation means comprising:

biasing means mounted on said barrel part for providing a bias force to said guide member in the direction of the optical axis when said guide member is at said first and second positions;

a contact member supported on said barrel part for contacting said guide edge and for providing a holding force to said guide member to counter the bias force provided by said biasing means; and

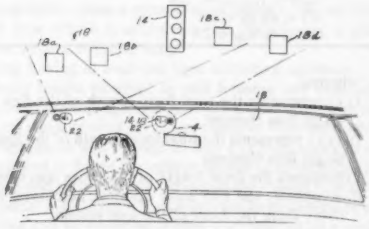
a changeover operation member mounted on said barrel part for rotation about the optical axis and arranged to be actuated at the exterior of said barrel part, said operation member being coupled to said contact member so that said contact member moves said guide member to a selected one of said first and second positions when said operation member is rotated; and

(e) zoom lens operation means connected to said guide member for rotation about the optical axis and arranged to be actuated at the exterior of said barrel part to rotate said guide member so that said guide slots axially move said optical means to perform zoom photography.

4,286,846
SIGNAL VIEWER FOR AUTOMOBILE

Dale E. Bollenbacher, 4304 Apt. 2B, Hickory Rd., Mishawaka, Ind. 46544

Continuation-in-part of Ser. No. 774,893, Mar. 7, 1977, abandoned. This application Mar. 18, 1980, Ser. No. 131,422
Int. Cl.³ G02B 3/00, 5/04
U.S. Cl. 350—436 **9 Claims**



1. Signal viewer for an automobile, comprising

a pair of lenses and means for mounting them on the windshield of the automobile in transversely spaced positions on opposite sides of a forward line of sight of the driver,

the lenses receiving light rays from overhead objects and deflecting them toward the horizontal within the automobile and thereby toward the driver,

the lenses encompassing fields of vision that are laterally spaced apart but overlapping, both fields constantly including common objects between the lateral limits of the two fields taken together, the lenses forming corresponding images and presenting them to the driver.

4,286,847
LIGHTWEIGHT INVERTED TELEPHOTO TYPE WIDE ANGLE LENS SYSTEM

Akiyoshi Nakamura, Sakai, and Hisashi Tokumaru, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 26, 1979, Ser. No. 79,191
Claims priority, application Japan, Oct. 6, 1978, 53-123910
Int. Cl.³ G02B 13/04
U.S. Cl. 350—459 **10 Claims**

1. An compact lightweight telephoto type wide angle lens

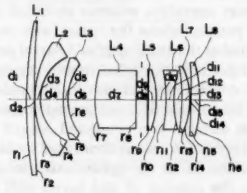
system having eight lens groups and eight lens elements comprising from the object to the image side:

a first lens group consisting of a first positive single lens element;

a second lens group consisting of a second negative meniscus single lens element convex to the object side;

a third lens group constituting of a third negative meniscus single lens element convex to the object side;

a fourth lens group consisting of a fourth positive single lens element;



a fifth lens group consisting of a fifth biconvex single lens element;

a sixth lens group consisting of a sixth biconcave single lens element;

a seventh lens group consisting of a positive meniscus single lens element convex to the image side, and

an eighth lens group consisting of an eighth positive single lens element, in which the lens system fulfills the following conditions:

$$0.75f < |f_{1,2,3}| < 1.1f \qquad f_{1,2,3} < 0$$
$$0.89f < f_{1,2,3,4,5} < 2.3f$$
$$0.5 < d_7/d_6 < 2.0$$
$$1.0 < d_8/d_{10} < 2.4$$

wherein;

$f_{1,2,3}$ represents the total focal length of the first to third single lens element;

$f_{1,2,3,4,5}$ represents the total focal length of the first to fifth single lens element;

f represents the focal length of the entire lens system, and

d_i represents the i-th axial distance numbered consecutively from the front of the lens system.

4,286,848

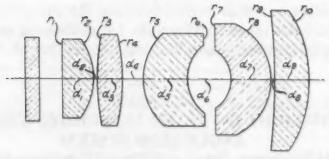
REPRODUCING OBJECTIVE LENS FOR VIDEODISCS

Lee Mickleson, Long Beach, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Filed Jan. 25, 1979, Ser. No. 6,327

Int. Cl.[3] **G02B** *9/60*

U.S. Cl. 350—467 **1 Claim**



1. A reproducing objective for videodiscs comprising:

a first, second, third, fourth and fifth lens;

said first lens being a positive lens, said second lens being a positive lens, said third lens being a negative meniscus lens with its convex surface positioned toward the object side, said fourth lens being a negative meniscus lens with its convex surface positioned toward the object side, said fifth lens being a positive meniscus lens with its concave surface positioned toward the object side, said reproducing objective lens for videodiscs satisfying the following conditions:

1. $0.30 \; \Delta r_6/f \geqq 0.23$
2. $0.27 \geqq d_1/f \geqq 0.15$
3. $1.4 \geqq r_6/|r_7| \geqq 0.9$
4. $6.0 \geqq |f_3|/|f_4| \geqq 2.5$
5. $0.31 \geqq d_5/f \geqq 0.21$

wherein

reference symbol f represents the focal length of the lens system as a whole, reference symbol f_3 represents the focal length of the third lens, reference symbol f_4 represents the focal length of the fourth lens, reference symbol r_6 represents the radius of curvature of the surface on the image side of the third lens, reference symbol r_7 represents the radius of curvature of the surface on the object side of the fourth lens, reference symbol d_1 represents the thickness of the first lens and reference symbol d_5 represents the thickness of the third lens;

and wherein

said reproducing objective for videodiscs has the following numerical data:

$r_1 = \infty$		
$d_1 = 2.7726$	$n_1 = 1.547$	$\nu_1 = 54.0$
$r_2 = -5.6308$		
$d_2 = 0.2500$		
$r_3 = 15.9099$		
$d_3 = 2.2050$	$n_2 = 1.672$	$\nu_2 = 64.0$
$r_4 = -14.0644$		
$d_4 = 1.9386$		
$r_5 = 5.4115$		
$d_5 = 3.7500$	$n_3 = 1.667$	$\nu_3 = 33.0$
$r_6 = 3.4870$		
$d_6 = 3.8136$		
$r_7 = -2.8396$		
$d_7 = 3.5075$	$n_4 = 1.667$	$\nu_4 = 33.0$
$r_8 = -5.2742$		
$d_8 = 0.2500$		
$r_9 = -69.2660$		
$d_9 = 3.0721$	$n_5 = 1.667$	$\nu_5 = 33.0$
$r_{10} = -10.2729$		

$f = 13.1297$ $f_3 = -66.667$ $f_4 = -21.786$

RMS wavefront errors = .021 1 = 2

wherein

reference symbols r_1 through r_{10}, respectively, represent radii of curvature of respective lens surfaces, reference symbols d_1 through d_9, respectively, represent thicknesses of respective lenses and air spaces between respective lenses, reference symbols n_1 through n_5, respectively, represent refractive indices of respective lenses, reference symbols ν_1 through ν_5, respectively, represent Abbe's numbers of respective lenses, reference symbol f represents the focal length of the lens system as a whole, reference symbol f_3 represents the focal length of the third lens, reference symbol f_4 represents the focal length of the fourth lens and reference symbol 1 represents the working distance of the lens system as a whole.

4,286,849
DIGITAL CAMERA

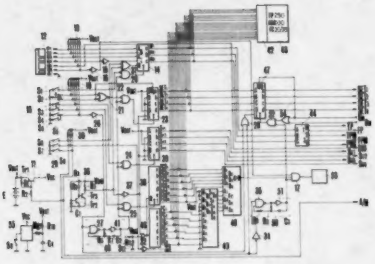
Masanori Uchidoi, Yokohama; Masami Shimizu, Tokyo; Nobuaki Date, and Hiroshi Aizawa, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1979, Ser. No. 9,806

Claims priority, application Japan, Feb. 9, 1978, 53/14332; Feb. 9, 1978, 53/14333; Feb. 9, 1978, 53/14334; Feb. 20, 1978, 53/18346; Mar. 29, 1978, 53/36379

Int. Cl.³ G03B *7/097*

U.S. Cl. 354—23 D **68 Claims**



1. An automatic exposure control apparatus for a camera comprising:

(a) light measuring means for producing an electrical signal proportional to the level of brightness of an object being photographed;

(b) exposure factor setting means for producing electrical signals proportional to preset values of exposure factors;

(c) exposure value computing means responsive to the electrical signals from said light measuring and said factor setting means for producing an output;

(d) shutter control means;

(e) diaphragm control means;

(f) exposure mode selecting means responsive to first and second switch signals for directing the output of said computing means to either of said shutter control means and said diaphragm control means, respectively; and

(g) signal forming means having terminals receptive of one of a number of different mode setting members upon reading of information on said mode setting member for producing either one of said first and second signals to be applied to said mode selecting means.

4,286,850
AUTOMATIC FOCUS INDICATING DEVICE FOR CAMERA

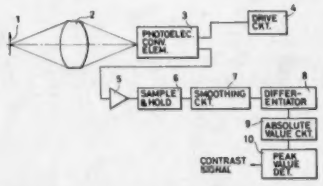
Harumi Aoki, Kiyose, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 4, 1980, Ser. No. 117,926

Claims priority, application Japan, Feb. 15, 1979, 54-16446

Int. Cl.³ G03B *3/10*

U.S. Cl. 354—25 **7 Claims**



1. A device for detecting and a indicating a focus position in a camera from a single contrast signal produced in response to an image of an object to be photographed with said camera comprising: means for producing said contrast signal in response to said image; means for detecting the directions of movement of a lens; a peak holding circuit for storing the maximum value of said contrast signal; reset pulse generating circuit means for generating a reset pulse for resetting the contents stored in said peak hold circuit; a comparator circuit for comparing a signal stored in said peak holding circuit means and said contrast signal for producing a focus signal when said contrast signal is equal to or greater than said signal stored in said peak holding circuit means; and means for producing an indication in response to said focus signal.

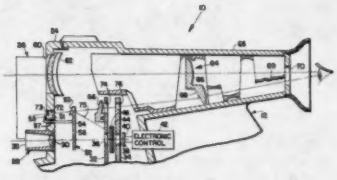
4,286,851
PHOTOGRAPHIC CAMERA APPARATUS FOR VISUALLY INDICATING THE STATUS OF AN EXPOSURE TRIM MECHANISM

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 929,840, Jul. 31, 1978, Pat. No. 4,200,373. This application Apr. 7, 1980, Ser. No. 138,107

Int. Cl.³ G03B *7/08, 17/20*

U.S. Cl. 354—53 **18 Claims**



1. Photographic camera apparatus for use in a camera of the automatic type which is adapted to use film having a given speed, said apparatus comprising:

a housing having at least one light-admitting aperture;

viewfinder means mounted in said housing and structured for observing through said aperture a field of view generally coextensive with the camera field of view with which said apparatus will be used so that a camera user can aim the camera to frame the subject matter to be included in a picture and including optical means structured to provide an optical path along which light rays from outside of said housing can be observed within said housing as a visible signal apart from said viewfinder means field of view;

automatic exposure means for controlling the exposure of a film, said automatic exposure means including manually adjustable trim means for selectively varying the control of said automatic exposure means, said trim means being movable between a nominal position at which the exposure delivered to the film is a predetermined value and other positions at which the exposure delivered to the film differs from said predetermined value by predetermined amounts, greater or less than said predetermined value, which depend on the position of said trim means, said trim means including means operative when said trim means is in its said nominal position for intercepting light rays traveling along said optical path and deviating said intercepted rays along a path which is outside of said optical path to thereby prevent said signal from being observed via said optical means and for permitting light rays from outside of said housing to enter said optical means when said trim means is in a position other than its nominal position to provide to a user of the camera a visual indication in said viewfinder means that said trim means is positioned at one of its positions other than its said nominal position so that the user of the camera can at his discretion adjust said trim means for an exposure that will produce a picture which will be either lighter or darker than the one that would be produced if said trim means remained un-

changed or can place said trim means in its said nominal position.

4,286,852

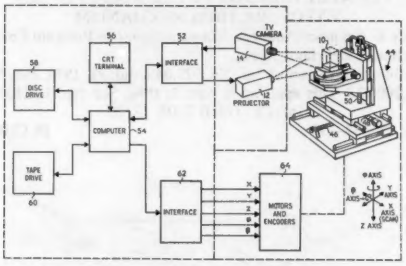
RECORDING IMAGES OF A THREE-DIMENSIONAL SURFACE BY FOCUSING ON A PLANE OF LIGHT IRRADIATING THE SURFACE

Howard Stern, Greenlawn, and Paul DiMatteo, Huntington, both of N.Y., assignors to Solid Photography, Inc., Melville, N.Y.

Continuation-in-part of Ser. No. 41,717, May 23, 1977, Pat. No. 4,238,147. This application Aug. 6, 1980, Ser. No. 175,769

Int. Cl.³ G03B *17/00, 29/00, 35/08*

U.S. Cl. 354—77 **15 Claims**



1. A method for recording surface characteristics of an object, comprising: generating a first plane of electromagnetic energy and directing said first plane of electromagnetic energy against a surface to be recorded for irradiating said surface in a substantially first planar section defined by the intersection of said first plane of energy and said surface; arranging a lens plane and a film plane of a camera so that said first plane of energy, said lens plane and said film plane all intersect in a common line; focusing said camera on said first plane of electromagnetic energy in a region about said surface to be recorded; recording the surface characteristics of said object on said first planar section as viewed by said camera; generating a second plane of electromagnetic energy and directing said second plane against said surface for irradiating said surface in a substantially second planar section defined by the intersection of said second plane and said surface, said second planar section having a thickness substantially less than said first planar section.

4,286,853

MICROFICHE CAMERA HAVING MOTOR CONTROL SYSTEM

Philip R. Norris, North Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 3, 1980, Ser. No. 136,933

Int. Cl.³ G03B *1/00*

U.S. Cl. 354—123 **14 Claims**

1. A camera for exposing a plurality of image areas on a single card-like film unit, said camera comprising:

means for supporting such a film unit at a film plane for longitudinal movement;

means for defining a laterally extending row of a plurality of image areas on a portion of the film unit supported at said film plane;

an image forming lens;

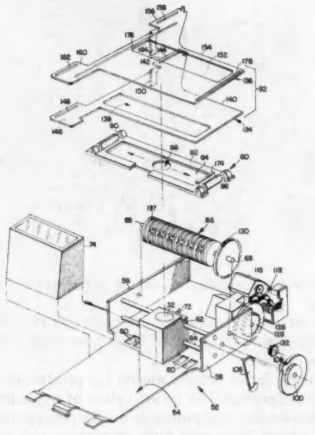
a carriage supporting said lens for incremental movement in linear passes along said row during which said lens is successively located in imaging relation with each of said image areas;

a barrel cam advanceable in predetermined rotational increments for incrementally moving said lens, said barrel cam being configured to move said lens in one direction from a starting position to a terminal position during one linear pass and to move said lens in the opposite direction back to said starting position during the next linear pass;

exposure means, including a shutter, operable for controlling the passage of image forming light through said lens to a corresponding one of said image areas;

means on said barrel cam for normally operating said shutter each time said barrel cam is advanced through one of said rotational increments;

film advancing means for incrementally advancing the film unit longitudinally after each linear pass to present the next portion of the film unit in registration with said image area defining means;



means, including an energizable electrical motor, for rotatably driving said barrel cam;

means for controlling operation of said motor, said motor control means being operable in an exposure cycle mode to effect advancement of said barrel cam through one rotational increment, and in a reset cycle mode to continuously advance said barrel to return said lens to said starting position; and

means for disenabling operation of said shutter by said shutter operating means on said barrel cam during each reset cycle and for enabling such shutter operation during each exposure cycle.

4,286,854

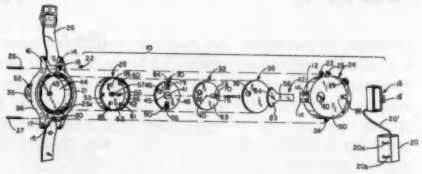
MAGNET-ACTUABLE FLASH APPARATUS

Bernard A. Seckendorf, Flushing, N.Y., assignor to Wrist-A-Matic, Ltd., Elmhurst, N.Y.

Filed Aug. 4, 1980, Ser. No. 175,152

Int. Cl.³ G03B *15/02, 15/03, 9/10*

U.S. Cl. 354—129 **16 Claims**



14. In a flash actuation system for a camera having a first aperture for passing light, a movably mounted shutter having a second aperture in alignment with said first aperture at a first position of the shutter and out of alignment with said aperture at a second position of the shutter, and means for moving the

shutter between said first and second positions; the improvement wherein said flash actuation system comprises a switch having contacts adapted to be displaced with respect to one another in a magnetic field, for controlling a flash, and magnet means mounted to be relatively movable with respect to said switch upon movement of said shutter, whereby the contacts of said switch have different relative positions with respect to one another at said first and second positions of said shutter.

4,286,855

ELECTROMAGNETIC RELEASING DEVICE

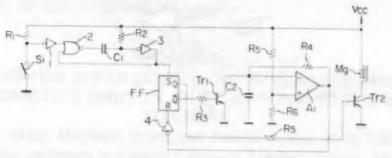
Hiroshi Hasegawa, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 15, 1978, Ser. No. 969,736

Claims priority, application Japan, Dec. 20, 1977, 52-170611[U]

Int. Cl.³ G03B *17/40*

U.S. Cl. 354—234 **6 Claims**



1. An electromagnetic releasing device for energizing a shutter release magnet, comprising a switch in series with said magnet for energizing said magnet when the switch is conductive, a bistable circuit having a first output connected to said switch for rendering said switch conductive when the bistable circuit is set in a first state, means responsive to actuation of a shutter release button for setting said bistable circuit in said first state, and means independent of whether said button remains actuated for resetting said bistable circuit in a second state a predetermined time after it is set in said first state and for thereby rendering said switch non-conductive, said resetting means comprises a timing circuit connected to a second output of said bistable circuit.

4,286,856

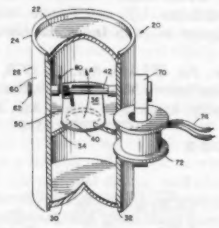
ELECTROMAGNETIC SHUTTER FOR LENS

Neal McGrath, 1223 E. Wilson, Wheaton, Ill. 60187

Filed Feb. 11, 1980, Ser. No. 120,360

Int. Cl.³ G03B *9/10, 1/00*

U.S. Cl. 354—234 **5 Claims**



1. An electromagnet shutter for a photographic lens comprising:

an optical stop mounted at a predetermined distance from the focusing elements of the photographic lens;

a flap mounted for rotating substantially along one side of said stop, said flap having a first position in which it blocks the passage of light through said stop and a second position in which it is removed therefrom;

an electromagnetic means for rotating said flap from its first position to its second position,

wherein said electromagnetic means comprises a permanent magnet mounted on said rotatable shaft and an electromagnet having a horseshoe-shaped core with two poles which surround said permanent magnet whereby, when said electromagnet is energized, the magnetic field produced causes said permanent magnet and attached shaft to rotate, thereby rotating said flap from its first position to its second position.

4,286,857

EXPOSURE CORRECTION WARNING DISPLAY DEVICE

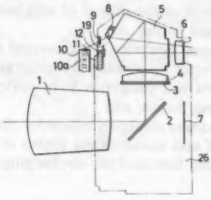
Kunio Mita, Kamifukuoka, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

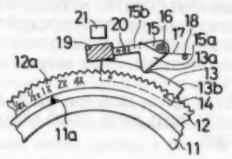
Filed Sep. 6, 1977, Ser. No. 830,961

Claims priority, application Japan, Sep. 8, 1976, 51-120714

Int. Cl.³ G03B *17/00*

U.S. Cl. 354—289 **2 Claims**





1. In an automatic exposure control type camera having a finder through which may be viewed an exposure information display region, and an exposure correcting ring which may be rotated to effect exposure correction, an exposure correction warning display device comprising:

a colored transparent film: and

means operated by said exposure correcting ring for moving said film to a position to that it appears in said exposure information display region when exposure correction is effected by rotating said ring, said means comprising a circumferential cam fixedly secured to said ring and a spring biased lever on one end of which is mounted said film and the other end of which abuts said cam.

4,286,858

VOLTAGE DETECTING DEVICE FOR CAMERA

Masayoshi Kiuchi, Yokohama, and Masaharu Kawamura, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 16, 1980, Ser. No. 159,493

Claims priority, application Japan, Jun. 15, 1979, 54-75215

Int. Cl.³ G03B *7/093, 17/18*

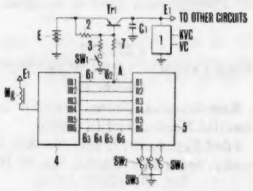
U.S. Cl. 354—289 **12 Claims**

1. A voltage detecting device for a camera provided with an analog-to-digital converter arranged to convert photographic information in an analog form into photographic information in a digital form and with a driving power source, comprising:

(a) switching means for applying the output of said driving power source to the integrator of said analog-to-digital

converter in such a manner that the output of said driving power source is integrated by said integrator, said switching means being arranged to operatively connect the output terminal of said power source to the input terminal of said analog-to-digital converter in response to an operation performed for the purpose of detecting the output of said driving power source;

(b) discharge means for discharging an electric charge stored at said integrator down to a predetermined value



when the level of the output of said integrator reaches a predetermined value;

(c) control means functionally connected to said analog-to-digital converter for causing the integrating and discharging actions of said integrator to be periodically repeated;

(d) annunciating means; and

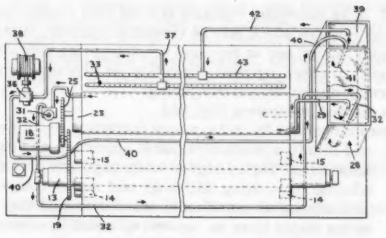
(e) output condition changing means for changing the output condition of said annunciating means in accordance with the integrating time and the discharging time of said integrator.

4,286,859

AIR POLLUTION ATTENUATION SYSTEM FOR COPIERS EMPLOYING NOXIOUS GAS IN A DEVELOPING CHAMBER THROUGH WHICH THE COPY PASSES FOR DEVELOPMENT

Clarence Kurek, Scottsdale, Ariz., assignor to Enervest, Inc., Englewood, Colo.

Filed Apr. 9, 1979, Ser. No. 28,055
Int. Cl.[3] B01D *50/00, 19/00;* **G03D** *7/00*
U.S. Cl. 354—300 **4 Claims**



1. An air pollution attenuation system for copiers employing a noxious gas in a developing chamber through which a sheet for development passes comprising

(a) a developing chamber having an inlet to receive a sheet and an outlet to discharge the sheet;

(b) a vacuum generating manifold external to the developing chamber, lying proximal to the surface of the sheet and positioned proximal to the outlet of the developing chamber extending generally transversely across said sheet and to its direction of movement for drawing residual noxious gas from the surface of said sheet and entraining the said gas in a contained stream;

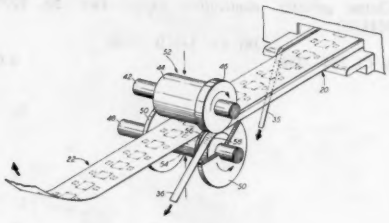
(c) means for passing the contained, noxious gas bearing stream through stripping means for removing substantial amounts of said noxious gas from said stream the stripping means emitting a gas capable of attenuating the noxious character of the noxious gas; and (d) means for passing the gas emitted from the stripping means to and discharging it in close proximity to the sheet on the opposite side of the vacuum generating manifold from said outlet.

4,286,860

APPARATUS FOR MAKING CARRIER TAPE

Michael T. Gursky, and William W. Pcihoda, both of Lehigh County, Pa., assignors to Western Electric Co., Inc., New York, N.Y.

Division of Ser. No. 8,621, Feb. 1, 1979, Pat. No. 4,227,983. This application Apr. 18, 1980, Ser. No. 141,433
Int. Cl.[3] G03D *3/13;* **H05K** *1/04, 3/00*
U.S. Cl. 354—319 **12 Claims**



1. Apparatus for forming a pattern in a strip of metal foil having no substantial resistance to bending, having a substantially unperforated drive margin on the strip and having a latent image of the pattern on the strip comprising:

means for performing a succession of steps to form the pattern in the strip;

means for successively gripping along the drive margin of the strip in a continuous manner and for driving the strip in a lengthwise direction through the succession of forming steps, such gripping and driving being done without disturbing the latent image;

means for guiding the driven strip through the succession of forming steps, each step requiring a separate exposure time interval suitable for such forming step; and

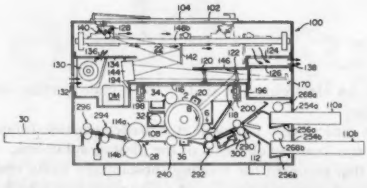
means for shielding the strip at one or more of the forming steps such that the pattern in the strip is exposed for a respective time interval suitable for the said forming step.

4,286,861

ELECTROSTATIC COPYING PROCESS AND APPARATUS

Shoji Matsumoto, Neyagawa; Toshikazu Matsui, Kishiwada; Toshimitsu Ikeda, Higashiosaka; Nobuhiko Kozuka, Suita; Hitoshi Nishihama, Uji, and Tatsuo Aizawa, Osaka, all of Japan, assignors to Mita Industrial Company, Ltd., Osaka, Japan

Division of Ser. No. 895,465, Apr. 11, 1978, Pat. No. 4,254,202. This application Mar. 30, 1979, Ser. No. 25,744
Claims priority, application Japan, Apr. 19, 1977, 52-44162
Int. Cl.[3] G03G *15/00*
U.S. Cl. 355—3 R **16 Claims**



1. An electrostatic copying apparatus comprising: a housing

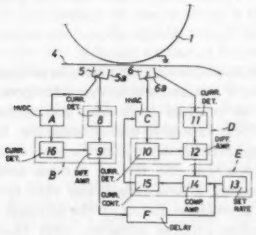
having on its top surface a transparent plate for supporting an original to be copied; a rotary drum disposed within the housing and having a photosensitive member on its surface; a charging, a developing and a transferring means which are successively arranged around the rotary drum along the moving direction of the surface of the rotary drum; an optical system for projecting an image of the original onto the surface of the rotary drum between the charging means and the developing means and having a lamp for illuminating the original; a receptor sheet conveying system defined between the surface of the rotary drum and the transfer means for conveying a receptor sheet; separator means in said housing for separating the housing into an upper section and a lower section and for substantially preventing any flow of the atmosphere within said housing between said sections, and the upper section having the optical system therein and the lower section having the rotary drum, the charging means, the developing device, the transferring means and the receptor sheet conveying system therein; and a cooling system in said upper section for sucking air from the outside of the housing into the housing for cooling said original illuminating lamp of the optical system and discharging the air out of the housing.

4,286,862

MEANS FOR SEPARATING A COPYING PAPER FROM A SENSITIVE BODY IN AN ELECTRONIC COPYING MACHINE

Yukio Akita; Hirotaka Izumi, and Junichi Asano, all of Tokyo, Japan, assignors to Copyer Company Limited, Tokyo, Japan

Filed Nov. 15, 1979, Ser. No. 94,482
Claims priority, application Japan, Nov. 22, 1978, 53-143506
Int. Cl.[3] G03G *15/00*
U.S. Cl. 355—3 SH **1 Claim**



1. Means for separating a copying paper from a sensitive body in an electronic copying machine comprising:

(a) means for detecting electric current for copying, said means for detecting a differential current between electric current flowing to a first electrode of a charged device for copying from a DC high voltage generator and electric current flowing to a shield case of said charged device for copying,

(b) means for detecting electric current for removing electric charges, said means for detecting a differential current between electric current flowing to a second electrode of a charged device for removing electric charges from an AC high voltage generator and electric current flowing to a shield case of said charged device, said electric current for removing electric charges being controlled to a setting rate in accordance with said differential current detected by said means for detecting said electric current for removing electric charges,

(c) means for controlling electric current for removing electric charges by adding to said setting rate said differential current detected by said means for detecting said electric current for copying, whereby the controlled signals are fed to said AC high voltage generator, and

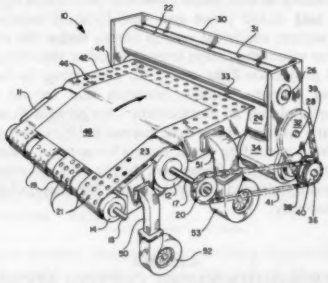
(d) a delay circuit means transmitting signals of said differential current for copying to said AC high voltage generator by delaying said signals for a time corresponding to a time for a point on said sensitive body to move a distance between said first electrode for copying and said second electrode for removing electric charges.

4,286,863

PRESSURE FUSING APPARATUS FOR AN ELECTROSTATIC REPRODUCING MACHINE

Frank H. Cornwall, Fairfield, and William A. Ross, Darien, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 10, 1979, Ser. No. 73,837
Int. Cl.[3] G03G *15/00*
U.S. Cl. 355—3 FU **4 Claims**



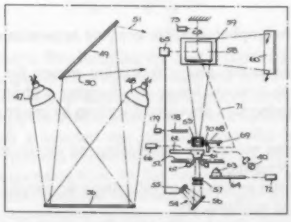
1. Apparatus for pressure fusing dry toner on a sheet, comprising a plenum having a flat surface with openings therein, said flat surface having an upstream end and a downstream end, means for drawing a vacuum within said plenum, a pair of juxtapositioned rollers nip forming in engagement with one another under sufficient pressure to fuse the toner, said rollers being located immediately adjacent the downstream end of said flat surface, means for rotating at least one of said rollers, and means for conveying a sheet across said surface from said upstream end to said downstream end and into the nip of said rollers, said vacuum means causing a sheet to be held flat against said surface and creating a drag on such sheet as the sheet is driven through said pressure rollers.

4,286,864

PHOTOPLASTIC FILM RECORDING AND MONITORING APPARATUS

Gordon Lysle, Greenlawn, and Kenneth R. Baur, Halesite, both of N.Y., assignors to Bell & Howell Company, Chicago, Ill.

Continuation of Ser. No. 873,932, Jan. 31, 1978. This application Jan. 31, 1980, Ser. No. 117,205
Int. Cl.[3] G03B *13/26, 27/52;* G03G *15/00*
U.S. Cl. 355—5 **28 Claims**



1. In photoplastic film recording and monitoring apparatus for selectively producing rippled image patterns in frame areas ofsuch film by image patterned electrostatic charge and heat deformation, the combination of a copy holding station, means

for flood lighting said copy holding station, means for projecting an image from said copy holding station over a first optical path, means for indexably supporting a transmissively readable fiche of photoplastic film in selectable frame positions at an image plane normal to said first optical path, means disposed in said first optical path between said image plane and said copy station for focusing an optical image of copy at said copy station onto the surface of a fiche at said image plane, a projection light source located on the opposite side of said image plane from said focusing means, a viewing screen, a rotatably mounted mirror assembly having one position for completing said first optical path to the exclusion of a second optical path, and a second position for completing said second optical path to the exclusion of said first optical path, said second optical path extending in succession from said projection light source through said image plane and said focusing means to said viewing screen, electrical switch means under the control of said mirror assembly, means interconnecting said switch means with said projection light source for energizing the latter only when said mirror assembly occupies said second position, means for applying an electrostatic charge to a fiche at said image plane within a frame area intersected by said first optical path during a recording cycle, means for applying image forming heat to film in said frame area during said recording cycle, and operator initiated control means for manipulating said mirror assembly.

4,286,865

ELECTROPHOTOGRAPHIC COPYING APPARATUS FOR THE PRODUCTION OF MULTIPLE COPIES FROM A SINGLE LATENT ELECTROSTATIC IMAGE

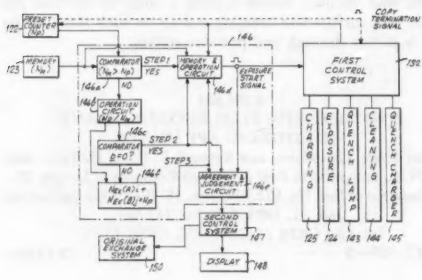
Toyokazu Satomi; Mitsuru Ohminato, both of Yokohama, and Yasuhiro Tabata, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 835,416, Sep. 27, 1977. This application Sep. 4, 1979, Ser. No. 72,453

Claims priority, application Japan, Sep. 29, 1976, 51/116900; Dec. 28, 1976, 51/157815

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 CU **15 Claims**



1. In an electrophotographic copying apparatus of the type having at least

latent electrostatic image formation means for forming a latent electrostatic image by charging a photoconductor and exposing said photoconductor to an image of an original;

development means for developing an electrostatic image with a developer;

image transfer means for transferring a developed image to a recording medium; and

cleaning means for cleaning said photoconductor; wherein a plurality of copies can be made from the same electrostatic image formed by said latent electrostatic image formation means, the improvement comprising:

first means for setting selectively the number of copies to be obtained from the same latent image, wherein a maximum number of copies is practically obtainable from the same latent image;

second means for setting selectively the number of copies to be obtained from the same original;

first control means for making said latent electrostatic image formation means inoperative during the period of time following the formation of the first copy until the formation of the final copy from the same latent image as set by said first means; and

second control means for actuating said cleaning means when the final copy from the same latent image is formed as set by said first means and when the number of copies set by said second means have been are obtained from the same original.

4,286,866

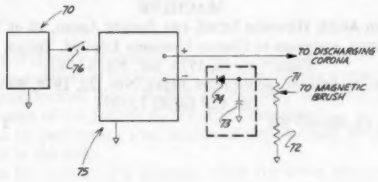
BIAS VOLTAGE CONTROL FOR ELECTROPHOTOCOPIER MAGNETIC BRUSH

John J. Stelben, Greenwich; Kim E. Siladi, Danbury; George A. Herman, Jr., Brookfield, and John E. Vesel, Stratford, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Feb. 1, 1980, Ser. No. 117,889

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 D **8 Claims**



1. In an electrophotocopying machine utilizing a two component developer material and having a reciprocating carriage for carrying an original document across the illuminating means, an endless re-usable photoconductor, said photoconductor rotating through two cycles for each copy produced of an original document and having a seam across the width thereof and having a total length less than the length to be imaged plus the length required for the physical location of all the photocopying process elements other than the transfer apparatus, a corona device for discharging electrical charge that might remain on the photoconductor after the developed image plus been transferred from the photoconductor, a magnetic brush developing device for developing the latent image on the photoconductor and removing untransferred developer material from the photoconductor, and a common source of internally generated voltage for both the discharging corona and the magnetic brush developing bias voltage, wherein the bias voltage for the magnetic brush developing device is terminated when the voltage to the discharging corona is terminated, an improvement for reducing the non-uniformity of charge deposited on the photoconductor to thereby increase photoconductor life while substantially maintaining the bias voltage during interruption of voltage to the discharging corona, said improvement comprising:

a switch on the input to the common source of internally generated voltage, said switch being opened simultaneously with the disengagement of the clutch controlling the photoconductor motion ot thereby terminate the common source of internally generated voltage;

means operatively connected to the common source of internally generated voltage for providing the bias voltage;

a charge retaining element connected in parallel to the means providing the bias voltage; and

a one way electrical valve operatively connected to the input for the charge retaining element and the bias voltage means, said charge retaining element substantially main-

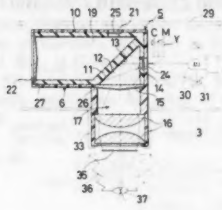
taining the bias voltage when the common source of voltage is terminated.

4,286,867

LIGHT SOURCE UNIT ASSEMBLY FOR PHOTOGRAPHIC ENLARGER

Atumi Kashiwagi, Nara, Japan, assignor to Fujimoto Photo Industrial Co., Ltd., Osaka, Japan

Filed Mar. 3, 1980, Ser. No. 126,720
Int. Cl.³ G03B *27/54*
U.S. Cl. 355—67 **7 Claims**



1. In an optical element for use in a photographic enlarger positioned on the optical axis of a light source between the light source and a negative for diffusing the light from the light source and illuminating the negative, a light source unit assembly comprising a frame having a diffusing tube at least in its interior and a partition provided in the frame and dividing the interior of the diffusing tube into a first diffusing chamber and a second diffusing chamber; the first diffusing chamber having a first light diffusing surface on the partition, a first light passing aperture positionable on the optical axis of the light source and opposed to the first diffusing surface, a first diffusing filter disposed across the path of light reflected from the first diffusing surface and a condenser positioned on the optical axis of the first diffusing filter and spaced apart from the filter to provide a first optical system; the second diffusing chamber having a second light diffusing surface on the partition, a second light passing aperture positionable on the optical axis of the light source and opposed to the second diffusing surface and a second diffusing filter disposed across the path of light reflected from the second diffusing surface; the first and second optical systems being alternatively positionable on the optical axis of the light source between the light source and the negative.

4,286,868

PHOTOGRAPHIC PRINTER WITH AUTOMATIC SENSOR CALIBRATION

Ronald C. Laska, Minnetonka, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Division of Ser. No. 862,733, Dec. 21, 1977, Pat. No. 4,172,659. This application Oct. 29, 1979, Ser. No. 89,547
The portion of the term of this patent subsequent to Oct. 30, 1996, has been disclaimed.
Int. Cl.³ G03B *27/80*
U.S. Cl. 355—68 **5 Claims**

1. In a photographic printer system having a first location along a path of advancement of a photographic film original at which light is passed through the photographic film original to expose a photosensitive medium, the improvement comprising:

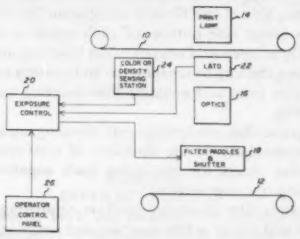
light source means for providing light to the photographic film original at a second location upstream of the first location along the path of advancement of the photographic film original;

a plurality of light sensors positioned at the second location for providing output signals indicative of light received from defined areas of the photographic film original;

calibration value means for calculating digital calibration values for each of the plurality of light sensors based upon values of the output signals under a reference condition in which a filter of essentially uniform attenuation is placed in the path of the light from the light source means to the plurality of light sensors;

digital storing means for storing the plurality of digital calibration values;

correcting means for correcting the output signals from the



plurality of light sensors during normal operation of the printer system based upon the stored plurality of digital calibration values;

and

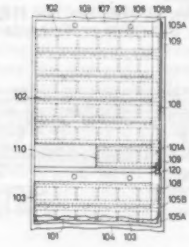
exposure control means for controlling exposures of the photosensitive medium as a function of the corrected output signals during normal operation of the printer system.

4,286,869

NEGATIVE FILM HANDLING METHOD AND APPARATUS

Mikio Kogane, and Seiichi Yamazaki, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 20, 1979, Ser. No. 105,484
Claims priority, application Japan, Jan. 5, 1979, 54/870; Mar. 6, 1979, 54/25748; Jun. 18, 1979, 54/75667
Int. Cl.³ G03B *27/62, 27/32*
U.S. Cl. 355—75 **27 Claims**



1. A negative film handling method comprising the steps of: inserting negative films into inserting and removing openings in negative sheets, positioning said negative sheets and attaching said negative sheets side-by-side on a flexible transparent belt in such a manner that said negative film inserting and removing openings of said negative sheets are aligned with one another perpendicularly to the negative film inserting and removing direction, and opening said negative film inserting and removing openings of said negative sheets including bending at least an edge portion of said flexible transparent belt.

10. An automatic negative film handling apparatus in which negative sheets into which negative films are inserted are attached side-by-side on a flexible transparent belt in such a manner that negative film inserting and removing openings of said negative sheets are aligned with one another perpendicu-

larly to the negative film inserting and removing direction, which apparatus comprises:

(a) negative sheet conveying means for intermittently conveying said negative sheets which contain said negative films and are attached to said flexible transparent belt;

(b) negative sheet opening means for bending upwardly an upper side portion on the negative film inserting and removing opening side of each negative sheet and one edge portion on the negative film inserting and removing opening side of said flexible transparent belt and for bending a lower side portion of each negative sheet downwardly to open said negative film inserting and removing opening thereby to separate the end portion of each negative film from said negative film inserting and removing opening;

(c) negative film conveying path forming means disposed perpendicularly to the direction of conveyance of said negative sheets for conveying each negative film to a printing opening section;

(d) negative film removing position regulating means for, while said negative film inserting and removing opening is opened so as to be separated from the end portion of said negative film, bringing into coincidence the longitudinal center line of said negative film with the longitudinal center line of said negative film conveying path forming means;

(e) negative film removing and inserting means for moving said negative film thus positioned onto said negative film conveying path and inserting said negative film into said negative sheet after printing;

(f) negative film picture detection notch detecting means including means for detecting a picture of said negative film for feeding said negative film as required to said printing opening section; and

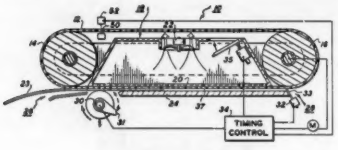
(g) negative film feeding means operated in accordance with a signal produced by said negative film picture detection notch detecting means for feeding said negative film uniformly to said printing opening section.

4,286,870

DOCUMENT BELT WITH DISCRETE VACUUM AREAS

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 10, 1980, Ser. No. 111,058
Int. Cl.[3] G03B *27/62, 27/64*
U.S. Cl. 355—76 **6 Claims**



1. In a document handling system for a copier in which documents to be copied at an exposure station are transported thereto by an apertured vacuum belt transport with a light reflective surface to provide an optical background for different sizes of documents to be copied at said exposure station, the improvement comprising:

at least two discrete minor vacuum aperture patterned areas spaced circumferentially along said surface of said belt in the direction of motion of said belt, said belt being unapertured in the space between said vacuum apertured areas, each said vacuum apertured area being smaller in area than the smallest document to be transported by said vacuum belt transport;

means to register a document in a loading station against said vacuum belt completely overlying one said vacuum apertured area of said belt; and

means to advance said apertured area of said belt from loading station to said exposure station of said copier;

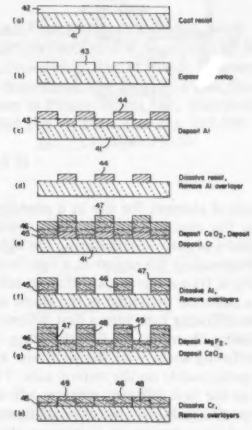
said spacing between said vacuum apertured areas being sufficiently great that none of the other said vacuum apertured areas are exposed for copying when said one vacuum apertured area is in said exposure station.

4,286,871

PHOTOGRAMMETRIC MEASURING SYSTEM

Kent E. Erickson, Brookside, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed Aug. 11, 1980, Ser. No. 176,886
Int. Cl.[3] G03B *27/00;* G01B *11/14;* H01J *3/14*
U.S. Cl. 355—133 **9 Claims**



8. The method of making a reflective phase grating which comprises:

(a) providing a plane-surfaced transparent support;

(b) forming on the plane surface of said support a regular period grating pattern of a first material which exhibits substantial solubility in a first liquid;

(c) depositing over the whole of said patterned support surface to a thickness of about λ/4 a layer of a second material consisting essentially of a dielectric having a given index of refraction, said second material exhibiting no substantial solubility in said first liquid;

(d) depositing over the whole of said second material layer to a thickness of about λ/4 a layer of a third material consisting essentially of a dielectric having an index of refraction significantly different from that of said second material, said third material exhibiting no substantial solubility in said first liquid;

(e) depositing over the whole of said third material layer a layer of a fourth material which exhibits no substantial solubility in said first liquid, but exhibits substantial solubility in a second liquid in which said second and third materials exhibit no substantial solubility;

(f) applying said first liquid to the resulting layered support, thereby dissolving said pattern of first material and effecting removal thereof from said support with overlying, coextensive portions of said deposited layers of second, third, and fourth materials;

(g) depositing over the whole of the resulting patterned support surface a λ/4 layer of said third material;

(h) depositing over the whole of said third material layer a λ/4 layer of said second material;

(i) applying said second liquid to the resulting layered support, thereby dissolving the remaining portions of said fourth material layer and effecting removal thereof from said support with overlying, coextensive portions of the

subsequently deposited layers of said second and third materials;

whereby said support is provided with a composite layer of substantially uniform thickness wherein said regular period pattern is reproduced in a first layer of dielectric material the reflecting surface of which is offset from said support surface by a difference of about λ/4 from that of a second, complementary pattern layer of the same dielectric material, thereby to yield in light reflected therefrom a phase difference of about λ/2 according to said pattern.

4,286,872

OPTICAL CORRELATOR

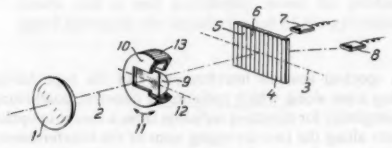
Eckart Schneider, Wetzlar, and Eckart Delingat, Nauborn, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Fed. Rep. of Germany

Filed Jul. 19, 1979, Ser. No. 58,865

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1978, 2835390

Int. Cl.³ G01P *3/36*; G01C *3/08*

U.S. Cl. 356—28 **5 Claims**



1. An optical correlator having an imagining system for the non-contact measuring of the velocity and/or direction of motion and/or the distance of an object, and comprising at least one grating structure having lines thereon mounted at least in the vicinity of the image plane of said imaging system and at least one photoelectric receiver arranged after the grating structure in the direction of the light, said receiver converting the modulated light fluxes resulting from the grating structure into electrical signals, the improvement comprising a supplemental structural device inserted between said imaging system and said grating structure of said correlator for matching the function of the distribution of the structural elements of the image of said object in said image plane with the function of the distribution of said grating structure by transforming spatial frequencies contained in the image of an object transversely to the direction of the lines of said grating structure; said matching resulting in improved electrical signals.

4,286,873

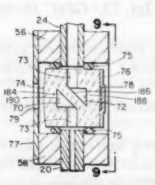
REFRACTOMETER CELL WITH INTEGRAL LENS

William W. Carson, Mendon, Mass., assignor to Waters Associates, Inc., Milford, Mass.

Filed Jun. 25, 1979, Ser. No. 51,811

Int. Cl.³ G01N *21/46*

U.S. Cl. 356—130 **9 Claims**



1. In a refractometer of the type including a cell in which a sample fluid is located and through which a light beam passes, said cell being constructed by fusing together a plurality of glass elements to form a chamber for said sample fluid, said light beam passing through said chamber, the improvement wherein said cell comprises an integral curved surface for acting as a lens to focus said light beam, said curved surface being an exterior surface of one of said fused-together glass elements, and further comprising a reflective coating applied to an exterior surface of one of said fused-together glass elements of said cell, wherein said reflective coating covers a limited area of said surface and thereby reflects only a portion of said light beam passing through said cell, whereby said reflective coating functions as a mask to block portions of said beam.

4,286,874

DIFFRACTOMETER

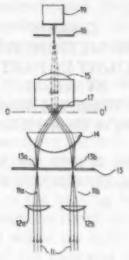
Francis H. Smith, York, and Richard W. Gale, Malton, both of England, assignors to Vickers Limited, London, England

Filed Apr. 11, 1979, Ser. No. 29,124

Claims priority, application United Kingdom, May 31, 1978, 14434/78

Int. Cl.³ G01N *21/00*

U.S. Cl. 356—338 **21 Claims**



1. A diffractometer comprising: means for illuminating a specimen plane at an acute angle thereto, the axis of the or each beam of illuminating light rays lying in a common plane; a positive lens having its principal axis substantially normal to the specimen plane, for converging rays diffracted substantially normally from the specimen plane; a field stop, adjacent the specimen plane, for restricting the light which is converged by the positive lens; an aperture stop, downstream of the positive lens, for limiting the light rays converged by the positive lens to those diffracted substantially normally to the specimen plane; and a photo-electric detection means, downstream of the aperture stop, for detecting light from the positive lens.

4,286,875

DIFFRACTOMETER

Francis H. Smith, York, England, assignor to Vickers Limited, London, England

Filed Apr. 11, 1979, Ser. No. 29,125

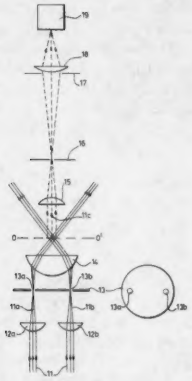
Claims priority, application United Kingdom, Apr. 12, 1978, 14434/78

Int. Cl.³ G01N *21/00*

U.S. Cl. 356—338 **26 Claims**

1. A diffractometer comprising means for illuminating a specimen plane at an acute angle thereto, the axis of the or each

beam of illuminating light rays lying substantially in a common plane, and a positive lens having its principal axis substantially



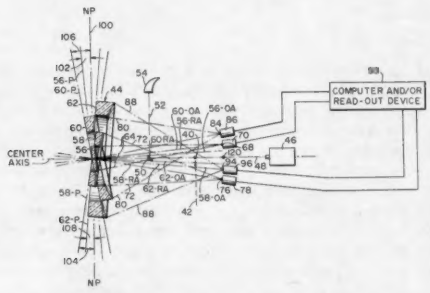
normal to the specimen plane, for converging rays diffracted substantially normally from the specimen plane.

4,286,876

APPARATUS AND METHOD FOR MEASURING SCATTERING OF LIGHT IN PARTICLE DETECTION SYSTEMS

Walter R. Hogg, South Miami, and Albert Brunsting, Miramar, both of Fla., assignors to Coulter Electronics, Inc., Hialeah,

Filed Jan. 2, 1979, Ser. No. 438
Int. Cl.³ G01N *21/00*
U.S. Cl. 356—343 **30 Claims**



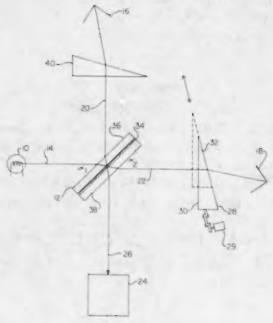
18. A composite mirror of multiple reflecting surface elements adapted to receive distributed radiant energy from a source that is directing such radiant energy in a conical solid angle generally along a principal optical axis directed toward the composite mirror, said mirror adapted to reflect at least portions and at most all of the radiant energy it receives back towards said source generally but along reflective axes which diverge from said principal optical axis so that different surface elements will receive different geometric zones of the distributed radiant energy and reflect and cause confluence of the energy in the respective zones at different locations laterally of the principal optical axis where the energy can be measured, said surface elements each being derived from and comprising a portion of a spherical mirror whose individual optical axis is tilted by a first angle relative to said principal optical axis whereby its reflective axis diverges from said principal optical axis at an angle which is twice said first angle.

4,286,877

REFRACTIVELY SCANNED INTERFEROMETER

William L. Clarke, South Laguna, Calif., assignor to Laser Precision Corporation, Irvine, Calif.

Filed Jul. 26, 1979, Ser. No. 61,010
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—346 **12 Claims**



1. A spectral analysis interferometer, of the type having diverging arms along which radiation is directed, comprising:

a beamsplitter for directing radiation from a source in optical paths along the two diverging arms of the interferometer, said beamsplitter including a partially reflecting surface which divides radiation between the interferometer arms, and a supporting substrate for said surface which tends to create an optical imbalance between the arms of the interferometer.

a first stationary reflector at the end of the first interferometer arm;

a second stationary reflector at the end of the second interferometer arm;

a scanning prism in one of the interferometer arms which is movable across that arm to vary the length of the optical paths in that arm; and

compensating means for avoiding aberrations due to the refractive characteristics of both the beamsplitter substrate and the scanning prism, said compensating means providing refractive effects in the other arm of the interferometer which substantially balance the refractive effects of the beamsplitter substrate and of the scanning prism in its centered position.

4,286,878

OPTICAL FIBRE INTERFEROMETRIC GYROMETER WITH POLARIZATION SWITCHING

Georges Pircher, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jul. 9, 1979, Ser. No. 56,107
Claims priority, application France, Jul. 10, 1978, 78 20540
Int. Cl.³ G01C *19/64*
U.S. Cl. 356—350 **5 Claims**

1. An optical fiber interferometric gyrometer comprising:

a laser source emitting a linearly polarised monochromatic beam;

an optical fiber wound around the axis of rotation of the gyrometer;

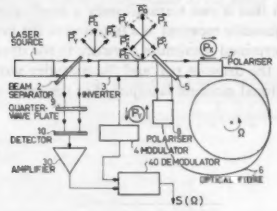
means for separating said beam into two waves, directing said waves for travel through said fiber in opposite directions and recombining the waves after travel through said fiber;

switching means having a first state transmitting the recombined waves without modification and a second state inverting the phase of said recombined waves;

fixed phase shift means for introducing a fixed phase shift equal to $\pi/2$ between the two waves;

modulating means for producing a signal for alternately shifting said switching means between said first and second states;

means for detecting the recombined waves after passage



through said switching means and said fixed phase shift means; and

a synchronous demodulator connected to said detector means, and to said modulating means for producing a signal indicating the rotation speed of the gyrometer.

4,286,879

DEVICE, PARTICULARLY FOR THE DIGITAL MEASURING OF FORCE

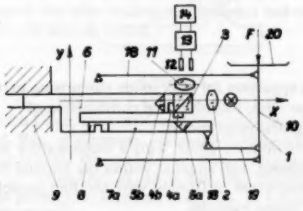
Gerd Jäger, Leninring 26; Wolfgang Bernuth, Rudolf-Breitscheid-Str. 11, both of 63 Ilmenau; Klaus Irrgang, Mühlgraben 10, 6306 Geraberg; Hans-Joachim Wendt, Thalheimstr. 4a, 8122 Radebeul, and Siegfried Honecker, Pestitzer Weg 14, 8020 Dresden, all of German Democratic Rep.

Filed Jul. 3, 1979, Ser. No. 54,599

Claims priority, application German Democratic Rep., Jul. 11, 1978, 206632

Int. Cl.³ G01B *9/02*

U.S. Cl. 356—358 **84 Claims**



1. A measuring device, particularly for the digital measurement of force, comprising a monochromatic light source; sensing means; a deformable body; at least one diaphragm operatively connected to said body; an optical splitter affixed to said body and adapted to receive light from said source; two interometer mirrors connected to said body; a first tilt-invariant reflector affixed to said body; a second tilt-invariant reflector affixed to said diaphragm; and force-receiving means operatively connected to said diaphragm so that the force to be measured is transmitted to said diaphragm causing the light from said source to be phase-shifted in said optical splitter, said mirrors and said first and second tilt-invariant reflectors in response to the displacement of said diaphragm under action of said force and thereupon detected by said sensing means.

4,286,880

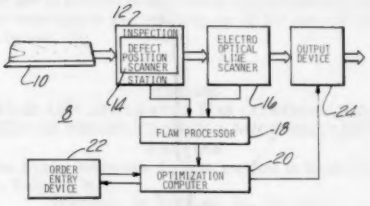
SCANNING LIGHT BEAM LUMBER DEFECT POSITION SYSTEM AND METHOD OF USING SAME

Allen E. Young, Highland, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jul. 30, 1979, Ser. No. 61,977

Int. Cl.³ G01N *21/89*; G06M *7/00*

U.S. Cl. 356—431 **22 Claims**



1. A system for detecting the positions of defects on at least one surface of a board of lumber comprising:

conveyor means for moving the board in a predetermined direction at a predetermined speed;

defect scanning means disposed along the conveyor means for generating a light curtain, having a moving light scan scanning at a predetermined frequency in a direction parallel to the predetermined direction and disposed slightly above and generally parallel to one surface of the board;

encoder means for measuring the distance of the leading edge of the board past a predetermined point within the light curtain and for generating board leading edge position signals representative thereof;

detector means, responsive to the interruption of the light curtain by an indicator indicating the leading edge of a particular defect on the moving board, for generating a position signal representative of the position of the leading edge of the defect within the ligh. curtain and responsive to the removal of the indicator from the light curtain indicating the trailing edge of the defect on the moving board for generating position signals representative of the position of the trailing edge of the defect within the light curtain and;

defect storage means for combining the board leading edge position signal, the defect leading edge and trailing edge position signals to generate defect position information in a defect data buffer containing signals representative of the positions of the leading edge and trailing edge of each particular defect on the board in usable coordinates.

4,286,881

SAMPLE CELL

Jay Janzen, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 26, 1979, Ser. No. 15,397

Int. Cl.³ G01N *21/01*

U.S. Cl. 356—440 **7 Claims**

1. Apparatus comprising

(a) a reflecting means,

(b) a first lens;

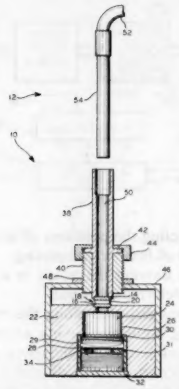
(c) a second lens;

(d) a block with a passage at least partially therethrough with said second lens being at least partially supported by said block in a position at least partially over one end of said passage and said reflecting means being positioned in said passage;

(e) a superstructure mounted on said block;

(f) a tubular member having a first end and a second end with said first lens being mounted adjacent the second end of said tubular member, the interior of said tubular member being adapted for receiving a fiber optic probe;

(g) a slidable mounting means affixed to said superstructure slidably mounted said tubular member adjacent said superstructure, said first lens, said second lens and said reflecting means being in alignment so that a beam of light emitted from a fiber optic probe when received by the interior of the tubular member passes through the first lens, the second lens and is reflected by the reflecting means back through the second lens and the first lens, in that order, to



the fiber optic probe, and wherein said first lens at least partially protrudes from adjacent said tubular member toward said second lens and said second lens at least partially protrudes from said block towards said first lens;

(h) a sample area having at least one dimension fixed by the distance between said first lens and said second lens; and

(i) squeezing means suitable for squeezing a sample positioned in the sample area between the first lens and the second lens to a predetermined thickness.

4,286,882

APPARATUS FOR THE AUTOMATIC, UNIFORM DRAWING-IN OF ELASTOMERIC MATERIAL INTO WORM EXTRUDERS

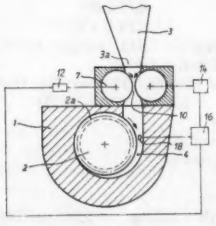
Walter H. Schiesser, Zürich, Switzerland, assignor to Schiesser AG, Switzerland

Filed Aug. 22, 1978, Ser. No. 935,802

Claims priority, application Switzerland, Sep. 2, 1977, 10742/77

Int. Cl.³ B28C *7/04*

U.S. Cl. 366—76 **9 Claims**



1. An apparatus for automatically, substantially uniformly drawing-in elastomeric material into a worm extruder, comprising:

a driven extruder worm;

at least one draw-in roll for mixture material which is to be processed arranged in spaced relationship from and upstream of the extruder worm; variable speed means for driving said draw-in roll independently of said extruder worm;

means defining a material draw-in pocket between the draw-in roll and the extruder worm downstream of the draw-in roll; and

control means for controlling the drive speed of the draw-in roll such that it can transmit only a predetermined maximum adjustable moment as a function of the pressure up to a predetermined maximum pressure in the draw-in pocket between the draw-in roll and the extruder worm wherein the rotational moment is adjusted in response to said pressure.

4,286,883

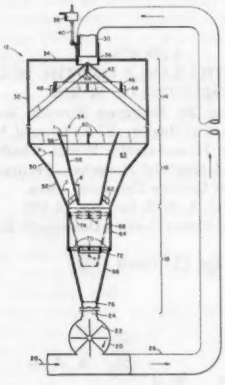
BLENDING APPARATUS FOR BULK SOLIDS

Jerry R. Johanson, Chelmsford, Mass., assignor to Jenike & Johanson, Inc., North Billerica, Mass.

Filed Aug. 20, 1979, Ser. No. 68,163

Int. Cl.³ B01F *5/24*

U.S. Cl. 366—137 **26 Claims**



1. Blending apparatus for bulk solids comprising particles of coarse and fine sizes, including the combination of

a bin having discharge means,

a conical distribution chute with a downwardly and outwardly sloping wall situated within the bin and having a greater coefficient of friction with the fine particles than with the coarse particles,

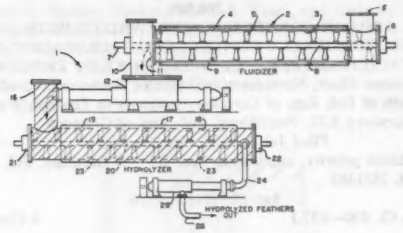
a deflector plate supported coaxially with the chute and within the bin and having a cylindrical interior surface spaced radially outwardly of the base of the chute, and

a catch cylinder supported coaxially with and above the chute in position to direct said solids falling therefrom on to said sloping wall, whereby the fine particles fall from said sloping wall in a lower trajectory than that of the coarse particles as a result of said different coefficients of friction, the deflector plate having its lowermost extremity above the trajectory of the fine particles and extending vertically from said extremity a sufficient distance to intersect the trajectory of the coarse particles so as to deflect the coarse particles while permitting the fine particles to fall undeflected therebeneath, whereby the coarse and fine particles are caused to collide.

4,286,884
APPARATUS FOR HYDROLYZING KERATINACEOUS MATERIAL

Rowland Retrum, 1226 Wilton La., Kirkwood, Mo. 63122

Division of Ser. No. 968,479, Dec. 11, 1978, Pat. No. 4,231,926.
This application Jan. 10, 1980, Ser. No. 110,950
Int. Cl.[3] C07G 7/00; A23J 1/10; B01F 7/04
U.S. Cl. 366—149 9 Claims

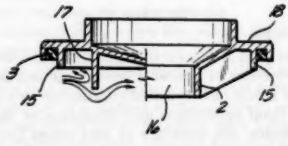


1. An apparatus for continuously hydrolyzing keratinaceous material comprising a first vessel, entry means connected with the said first vessel for continuously delivering the material into the same, agitating means provided in said first vessel for simultaneously violently agitating and moving said material through said vessel, said agitating means being rotational and capable of revolving at speeds of between about 150 to 350 rpm, heating means operatively associated with said first vessel and capable of heating any material traversing therethrough up to a temperature of less than 212° F. and without any significant build up of pressure within said vessel, a second vessel, pump means interconnecting between the said first and second vessels and when operative capable of continuously transferring the fluidized material from the first said vessel into the second said vessel, another agitating means provided in said second vessel and capable of revolving for agitating the material pumped therein, another heating means operatively associated with the said second vessel and capable of heating the material traversing therethrough to a temperature of between 265° F. to 365° F. while creating a pressure therein of between about 25 to 150 psig, said pump means circumventing the passage of any second vessel generated pressure into the first said vessel, and another pump means connecting with the said second vessel and when operative providing for the continuous discharge of the now hydrolyzed material and some pressure from the said second vessel.

4,286,885
FILLER CAP FOR A MIXER

Paul-Ulrich Uibel, Ennepetal, and Manfred Dörr, Bochum, both of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Dec. 31, 1979, Ser. No. 112,409
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1979, 7900590[U]
Int. Cl.[3] B01F 15/00
U.S. Cl. 366—347 7 Claims

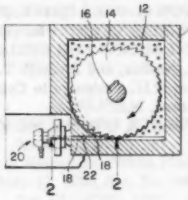


1. A filler cap for a household mixer of the type having rotary blades for mixing the media contained in the filler cap and a locking arrangement, comprising a filler tube to provide a funnel inlet for the media to be mixed, said filler tube having a filling opening positioned concentrically to the axis of rotation of the mixer; and a sealing ring connected to said filler tube, said filler tube including a plurality of ribs formed at the underside thereof and extending between a border of said filling opening and said sealing ring, said ribs being projected tangent to said filling opening so that vertically acting forces exerted by a ring of rotating liquid tending to be thrown upwardly due to rotation of said blades, are substantially negated due to interception and breaking up of the ring of rotating liquid by said ribs.

4,286,886
METHOD AND APPARATUS FOR CONTROLLING THE FEED OF PROJECTILES IN A MICROBALLISTIC PRINTER

Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Valhalla, N.Y.

Filed Dec. 28, 1979, Ser. No. 107,823
Int. Cl.[3] B41J 3/02
U.S. Cl. 400—118 6 Claims

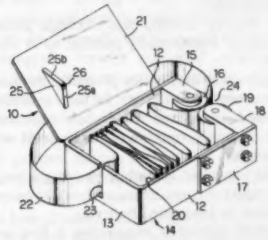


1. In a microballistic printer in which projectiles are fed at a feeding station from a projectile reservoir to a gun for projection to a printing station and then recycled to the reservoir, a venting duct positioned between the feeding station and the gun, a deflector positioned adjacent the venting duct adapted to deflect projectiles being fed toward the gun into the venting duct before the projectiles reach the gun, a gate in said venting duct adapted to block projectiles from leaving said duct, and means for controlling said gate.

4,286,887
ENDLESS RIBBON CASSETTE

Minoru Hisakawa, and Tsugio Okamoto, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 15, 1979, Ser. No. 85,068
Claims priority, application Japan, Oct. 19, 1978, 53-144036[U]
Int. Cl.[3] B41J 33/10
U.S. Cl. 400—196.1 5 Claims



1. A ribbon cassette for an endless-looped ink ribbon of up to a given width, the cassette having a ribbon chamber which has an upper portion, a floor and a wall with a depth slightly larger

than the given width of the ribbon for storing the ribbon in a stuffed state therein; an inlet opening and an outlet opening formed in said wall; a cover member having a lower surface covering said upper portion of said chamber; and ribbon feed means for feeding the ribbon into said chamber through said inlet opening and drawing out the ribbon from said chamber through said outlet opening, wherein the improvement comprises a depending plate formed on said lower surface of said cover member in a position near said outlet opening, said depending plate being in form of a substantially isosceles triangle which has a substantially roundish tip at its vertex, said depending plate having a base portion which is elongated in a direction perpendicular to that direction in which the ribbon moves from said inlet opening towards said outlet opening along a ribbon path of given width, with length of said base portion smaller than the given width of the ribbon path, and said depending plate depending from said cover member towards the floor such that the distance between said roundish tip at said vertex of said depending plate and the surface of the floor is smaller than the given width of the ribbon, while allowing the ribbon to pass over said roundish tip.

4,286,888

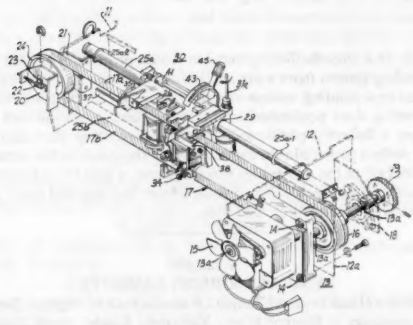
BI-DIRECTIONAL BELT DRIVE, PRINT HEAD MOUNTING MEANS AND PRINTING PLANE ADJUSTMENT MEANS FOR SERIAL PRINTERS

Lewis W. Bennett, Nashua, and Frederik T. Van Namen, Londonderry, both of N.H., assignors to Centronics Data Computer Corp., Hudson, N.H.

Filed Dec. 28, 1978, Ser. No. 974,067

Int. Cl.³ B41J *19/00*

U.S. Cl. 400—320 **14 Claims**



1. Carriage driving means for printers and the like comprising:

a belt having upper and lower belt runs;

means for driving said belt to move the upper and lower belt runs in opposing directions;

a carriage assembly;

means for slidably guiding said carriage assembly along a path arranged substantially parallel to at least one run of said belt;

a pair of jam cleat assemblies pivotally mounted upon said carriage assembly adjacent to and extending generally toward said upper and lower belt runs, respectively, a solenoid assembly operatively associated with each jam cleat assembly;

each of said jam cleat assemblies having a wedge arm portion extending diagonally away from its pivotal mounting and toward its associated belt run;

each jam cleat assembly comprising a first arm extending outwardly from said pivotal mounting and being operable by its associated solenoid assembly for pivoting the jam cleat assembly;

each jam cleat assembly comprising a second arm extending outwardly from said pivotal mounting toward and having a free end for engaging the free end of the second arm of the other jam cleat assembly; and

a small, single spring member embracing the free ends of said second arms and urging said second arms together toward a neutral position whereby both wedge arm portions are displaced from engagement with said belt runs when the solenoid assemblies are deenergized.

4,286,889

ERROR CORRECTING TYPEWRITER WITH ELECTRONICALLY CONTROLLED BACKSPACING TO FACILITATE PERFECT OVERSTRIKE OF ERRORS

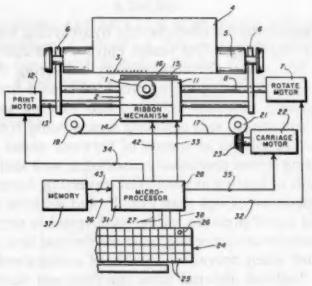
Hermann Ebert, Nuremberg, and Gunter Bachmann, Zirndorf, both of Fed. Rep. of Germany, assignors to Triumph Werke Nurnberg A.G., Nuremberg, Fed. Rep. of Germany

Filed Jul. 5, 1979, Ser. No. 54,942

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1978, 2831488

Int. Cl.³ B41J *29/16*

U.S. Cl. 400—697.1 **4 Claims**



1. In a typewriter having a carriage and a stepping motor connected to incrementally drive said carriage in escapement direction to print a line of characters and in backspace direction to correct errors,

a backspace correction key, and

control means responsive to operation of said backspace correction key for energizing said stepping motor to move said carriage in backspace direction twice the width of the last character printed and in escapement direction the width of the last character printed thereby to accurately locate said carriage at the last printed character space for correction.

4,286,890

GEL OR WAXY ARTICLES

Heinz H. Dickmann, Bühl; Dieter Hechenberger, Sinsheim-Eschelbach, and Richard Krattner, Bühl-Neusatz, all of Fed. Rep. of Germany, assignors to Lingner & Fischer GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 716,875, Aug. 23, 1976, abandoned. This application Dec. 1, 1978, Ser. No. 965,693

Claims priority, application United Kingdom, Aug. 15, 1975, 33997/75

Int. Cl.³ B43K *27/02*

U.S. Cl. 401—19 **4 Claims**

1. A shaped solid article for the application to a work surface of a reactive mixture of a curable epoxy resin and curing agent therefor, said article having a configuration about a central axis adapted for hand application and consisting of two discrete contiguous zones, the interface of said zones being aligned coaxially with said central axis, a first of said zones consisting of a solid gel or waxy mass with said curable epoxy resin dispersed therein and the second of said zones consisting of a solid gel or waxy mass with said curing agent dispersed

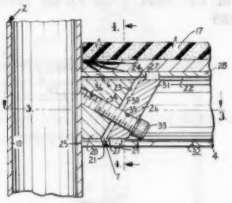
therein, said epoxy resin and said curing agent being held in non-reactive relationship by said gels or waxy masses until mixed upon simultaneous or consecutive frictional transfer of both of said gels or waxy masses from said article to a common area of a work surface.

4,286,891

CONNECTOR FOR AN ELONGATE MEMBER IN FRAME STRUCTURES

James L. Gerner, Shawnee Mission, Kans., and Arde Rameshotham, Kansas City, Mo., assignors to Fixtures Manufacturing Company, Kansas City, Mo.

Filed May 1, 1979, Ser. No. 35,067
Int. Cl.³ F16B *7/18*
U.S. Cl. 403—7 **8 Claims**



1. A structural member comprising in combination first and second elongate members joined by a connector; said combination wherein:

(a) said first member has a lug fixedly attached thereto and extending outwardly therefrom;

(b) said second member has an end portion for connection to said first member, said end portion including an annular axial bore;

(c) a plate member fixedly attached to said bore and having a first and second face; said first face being at an angle with respect to the axis of said bore;

(d) said lug having planar sides and being of a shape and size to fit in said bore; said lug having a plurality of opposed edges for linear engagement with said bore; said lug including an end face substantially parallel to and in opposing relationship with said plate member first face;

(e) elongate fastener means substantially normal to said plate second face; said fastener means extending through said plate member into said lug member for securely positioning said plate member in relationship to said lug member such that said first member is located and maintained in a predetermined position relative to said second member; and wherein

(f) said second member includes an aperture near said plate member so as to provide access in applying and removing said fastener means.

4,286,892

MOUNTING ASSEMBLY FOR AN AGRICULTURAL IMPLEMENT

Thomas W. Wedman, Harper, Kans., assignor to Green Line, Inc., Harper, Kans.

Filed Apr. 9, 1979, Ser. No. 28,454
Int. Cl.³ F16B *2/02*
U.S. Cl. 403—262 **20 Claims**

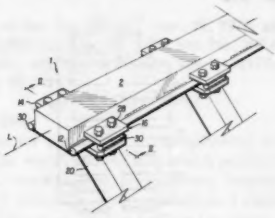
1. A connecting assembly comprising:

a frame member having a first flat surface portion and adjacent opposing side portions;

at least one pair of flange members extending from said opposing side portions adjacent said flat surface;

at least one pair of L-shaped clamp members engaging said at least one pair of flange members, each having apertures formed therein and each having a base and a leg portion extending from said base;

a support member having at least one flat surface portion engaging said first flat surface portion of said frame member and said leg portions of said at least one pair of L-shaped clamp members and including first and second apertures formed therein and disposed opposite said apertures in said at least one pair of L-shaped clamp members; and



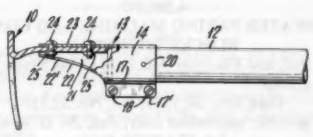
securing means mounted within said apertures of said at least one pair of L-shaped clamp members and said support member and disposed between said at least one pair of flange members and said leg portions of said at least one pair of L-shaped clamp members, respectively, for connecting said support member and said frame member.

4,286,893

HANDLE ATTACHING MEANS FOR RAKES AND THE LIKE

Francis Pomares, 124 Russell St., White Plains, N.Y. 10606

Filed May 12, 1980, Ser. No. 148,767
Int. Cl.³ B25G *3/00*
U.S. Cl. 403—301 **1 Claim**



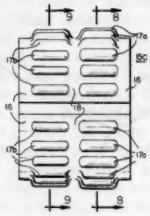
1. Means for attaching an elongated handle to an implement such as a rake or hoe having a narrow elongated metal member extending therefrom, said attaching means comprising a longitudinally slotted cylindrical portion having inwardly extending protrusions for receiving an end of said elongated handle, the edges of said member adjoining said slot having cooperating outwardly extending substantially parallel flanges, means engaging said flanges to move them one toward the other to clamp said cylindrical member tightly about said handle, said attaching means further including a forwardly extending generally arcuate portion having a radius corresponding to the radius of said cylindrical portion and an arcuate width approximately equal to the circumferential length of said cylindrical portion and integrally formed with said cylindrical portion, said forwardly extending portion gradually decreasing in arcuate width forming a tapered portion and terminating in a substantially U-shaped portion having an internal width approximately equal to the width of said narrow elongated member, said U-shaped portion having a flattened portion joining the legs of said U-shaped portion and extending rearwardly to a point spaced from said cylindrical portion, reinforcing beads formed on the legs of said U-shaped portion and extending one toward the other, said flattened portion and said narrow elongated member having cooperating openings, and fastening means engaging said openings to secure the narrow elongated member to said forwardly extending portion of said attaching means.

4,286,894

TOLERANCE RINGS

Raymond A. Rongley, Newtown, Pa., assignor to Roller Bearing Company of America, West Trenton, N.J.

Filed Mar. 21, 1979, Ser. No. 22,448
Int. Cl.[3] F16D 1/06
U.S. Cl. 403—372 6 Claims



1. A tolerance ring for positioning between two radially spaced annular surfaces comprising

a metallic strip of resilient sheet metal of split ring shape having cylindrical side rims and a plurality of individual resilient corrugations extending from said strip and uniformly spaced around the periphery of the strip,

said corrugations being positioned intermediate said rims and spaced from each other,

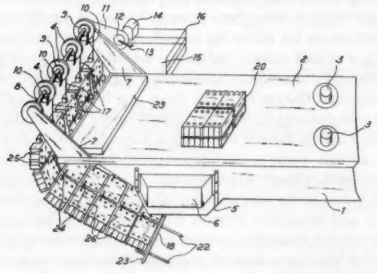
the corrugations being of a plurality of heights of different dimensions whereby successively different radial spring actions are exerted upon force application on the corrugations in any individual direction, the corrugations of any specific height providing identical multiple spring actions when positioned between said radially spaced annular surfaces.

4,286,895

UNDERWATER PAVING MACHINE AND CONCRETE BLOCKS THEREFOR

Giovanni Poli, and Vincenzo Poli, both of Via Sacca 1, Colorno (Parma), Italy

Filed Jun. 26, 1979, Ser. No. 52,227
Claims priority, application Italy, Jun. 29, 1978, 42514 A/78
Int. Cl.[3] E02B 3/12
U.S. Cl. 405—17 9 Claims



1. An apparatus for forming and laying an endless, flexible underwater mat consisting of wire and preformed slotted blocks comprising:

a mat laying barge,

a pair of upwardly and outwardly extending arms at the edge of the laying barge,

a rotating shaft supported by the arms,

a plurality of keyed spools mounted along the shaft, whereby, after endless wire is suspended from each of the spools, slotted preformed blocks are placed around the wire and fastened to the wire and adjacent blocks by clipping means thereby forming a mat,

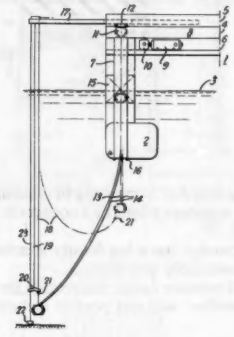
and means for lowering the endless mat in place as at least one row of blocks is clipped into place.

4,286,896

DIVING STRUCTURE AND METHOD OF DEPLOYMENT OF THE STRUCTURE

Daniel T. Melitz, London; Kenneth L. Searle, Havant, and Brian E. Woodman, Wickham Bishops, all of England, assignors to The British Petroleum Company Limited, London, England

Filed Nov. 21, 1979, Ser. No. 96,400
Claims priority, application United Kingdom, Sep. 15, 1979, 32050/79
Int. Cl.[3] B63C 7/02, 11/00, 11/44
U.S. Cl. 405—185 10 Claims



1. A diving bell deployment structure comprising a launch tube capable of launching a diving bell, the bell having a bell hoist wire and means for lowering and raising the bell via said bell hoist wire characterised in that a boom is adapted to be positioned from the structure to a point vertically above the desired underwater deployment position, the boom carrying a boom hoist wire which is capable of connecting to the bell through the base of the launch tube so that differential pay out of the boom hoist wire and bell hoist wire allows exit of the bell from the launch tube and lateral deployment of the bell between the boom and launch tube.

4,286,897

DOCK CLAMP APPARATUS

Philip A. Suskind, 416 Salt Springs Rd., Syracuse, N.Y. 13224

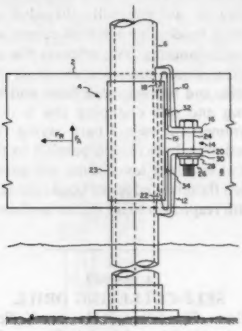
Filed Jan. 7, 1980, Ser. No. 110,127
Int. Cl.[3] F16B 2/04
U.S. Cl. 405—221 10 Claims

6. A dock clamp assembly for supporting a dock section at an adjusted height, comprising:

(a) at least one pair of sleeve members attached to either side of said dock section for receiving corresponding post members that are slidable in the axial direction within said sleeve members, the outer wall of said post members being in close proximity with the inner wall of said sleeve members when said members are centered on one another,

(b) prong means for insertion at opposing ends and at one side of one of said sleeve members between the inner wall of said sleeve member and the outer wall of a corresponding post member, said prong means being constructed so as to apply a radial force to said inner and outer walls in a direction that drives said walls together at the side opposite to said one side in response to an applied axial force, and

(c) further means for applying an axial force to said prong means, whereby the application of sufficient axial force



provides a fixed frictional coupling between corresponding post and sleeve members.

4,286,898

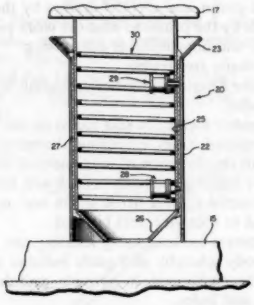
RELEASABLE CONNECTION

Donald C. Stafford, Hinsdale, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Aug. 16, 1979, Ser. No. 66,934

Int. Cl.³ E02B *17/00*; F16L *53/00*

U.S. Cl. 405—224 **12 Claims**



1. A releasable connection comprising:

a first member removably inserted in a second member with space between adjacent opposing surfaces of the members,

means adapted to retractably extend from the first member to the second member to temporarily hold the first member inside the second member in spaced-apart arrangement,

a solid mass of a material, in the space between the members, which firmly joins the members together,

said solid material having substantial compressive, tensile and shear strength, and being convertible by heat at a sufficiently high temperature to a physical state in which it has much lower compressive, tensile and shear strength, and

means associated with at least one of the members for supplying heat to the material.

4,286,899

PROCESS FOR POSITIONING STRENGTHENING RODS IN MINE LEVELS AND PUBLIC WORKS

Alain Benichou, Pontallier sur Saone, and Raymond J. Perraud, Villeurbanne, both of France, assignors to S.A.E.I. Celite, Cote d'Or and Societe d'Etude et de Construction de Machines pour Toutes Industries SECOMA, Rhone, both of, France

Continuation of Ser. No. 960,647, Nov. 14, 1978, abandoned. This application Sep. 25, 1980, Ser. No. 190,652

Claims priority, application France, Nov. 14, 1977, 77 34086; Mar. 17, 1978, 78 07763

Int. Cl.³ E21D *20/02*

U.S. Cl. 405—260 **13 Claims**

1. A process for positioning a strengthening rod in mine levels and public works and the like, which process comprises

storing a previously mixed thermosetting resinous composition which includes a resin, an inhibitor, a catalyst and an abrasive filler in an amount sufficient to cause generation of substantial heat upon rotation of a metal rod at about 800 rpm in contact therewith, said composition not being hardenable at room temperature;

introducing into a long bore made in a wall or other surface to be strengthened, said previously mixed thermosetting resinous composition not hardenable at room temperature, and an unpreheated metal rod of substantially the same length as said bore; and

rotating said rod at a rotation speed of at least 800 rpm and sufficiently great to cause it and said composition to heat up by friction between the rotating rod and the composition, particularly said abrasive filler, to the hardening temperature of said composition so as to initiate hardening of said thermosetting resinous composition and cause said rod to be sealed in said bore by the hardening of said thermosetting resinous composition as a result of heat generated substantially solely by rotation of said unpreheated rod.

4,286,900

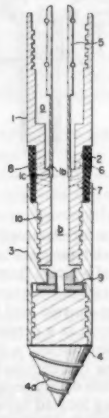
INJECTION DEVICE OF CHEMICAL FLUIDS FOR IMPROVEMENTS OF THE GROUND

Akira Sugimoto, Funabashi, and Hiroshi Sugimoto, Chiba, both of Japan, assignors to Tokyo Chika Koji Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1979, Ser. No. 87,953

Int. Cl.³ C09K *17/00*; E02D *3/12*

U.S. Cl. 405—269 **3 Claims**



1. An injection device for injecting a mixture of two fluids,

fluid-A and fluid-B, into the ground for hardening the ground, said injection device comprising:

a hollow outer pipe for injecting the fluid-A therethrough, said hollow outer pipe having an inwardly stepped portion on the inside wall for defining an upper greater diameter space and a lower lesser diameter space within the hollow interior thereof said hollow outer pipe having means for sealing closed the lower end thereof and said hollow outer pipe further having an annularly extending recessed portion on the outer surface thereof;

a hollow inner pipe coaxially positioned within said hollow outer pipe within said upper greater diameter space, said hollow inner pipe sealingly connected at the lower end thereof to the inside wall of said hollow outer pipe at said inwardly stepped portion wherein the hollow interior of said hollow inner pipe communicates with said lower lesser diameter space for injecting fluid-B through said hollow inner pipe into said lower lesser diameter space; and

resilient seal means located in said angularly extending recessed portion, said hollow outer pipe having first port means for connecting said upper greater diameter space with the exterior at said annularly extending recessed portion for allowing fluid-A to flow therethrough and second port means for connecting said lower lesser diameter space with the exterior at said annularly extending recessed portion for allowing fluid-B to flow therethrough, said resilient seal means for sealing said first and second port means closed when fluid-A and fluid-B are not being injected through said injection device and for defining a mixing chamber for mixing fluid-A and fluid-B and allowing the mixture to flow into the ground by expanding radially away from said annularly extending recessed portion.

4,286,901

CLAMPING DEVICE FOR CLAMPING A TURNABLE CUTTER BLADE ON A TOOL HOLDER

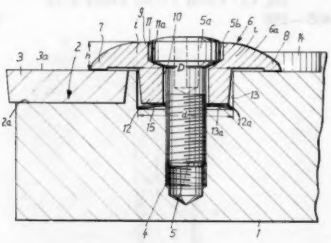
Otto Eckle, Loechgau, Fed. Rep. of Germany, assignor to Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH, Besigheim, Fed. Rep. of Germany

Filed Oct. 15, 1979, Ser. No. 85,176

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1978, 7831988[U]

Int. Cl.³ B23P *15/30*

U.S. Cl. 407—109 **14 Claims**



1. In a clamping device for clamping a turnable cutter blade on a tool holder with a clamping jaw which has the construction of a two-arm lever, of which a front lever arm is supported on an upper side of said turnable cutter blade and presses same against a support surface on said tool holder and of which a rear lever arm is supported in a centering recess in said tool holder, said clamping jaw having a center part with means defining a hole extending therethrough, and a locking screw extending through said hole in said center part of said clamping jaw, said center part being located between said front and rear lever arms and is screwed into an internally threaded opening in said tool holder, the improvement comprising wherein said clamping jaw has on said center part a projection which is arranged coaxially with respect to the internally threaded opening, said projection having an opening therethrough for said locking screw, wherein a recess which is arranged coaxially with respect to said internally threaded opening is provided in said tool holder, into which recess is received said projection of said clamping jaw, wherein the exterior surface of said projection whose cross section at any point along its length is a circle, and wherein said front and rear lever arms are equally long and said clamping jaw is constructed as a rotationally symmetrical swivel part having two lateral flattened edge portions which extend parallel to the longitudinal axis of said front and rear lever arms and parallel to one another, and which flattened edge portions extend approximately tangentially with respect to said exterior surface of said projection.

4,286,902

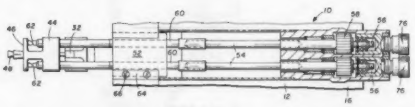
SELF-COLLETING DRILL

Robert L. Gagliano, Glendale, and Herman G. Feuerstein, Hacienda Hts., both of Calif., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 9, 1980, Ser. No. 110,579

Int. Cl.³ B23B *45/14*

U.S. Cl. 408—79 **5 Claims**



1. An improved self-colleting drill including a hollow body, an air motor journaled in the body, a piston reciprocable in the body, a pair of rotatable drive shafts driven by the air motor, valve means in said body arranged to actuate said motor and piston, a foot member mounted on the body for engaging and holding a work piece, the foot member being operably connected to the piston, and a collet carried by the foot member and actuatable by the piston to hold the work piece against the foot member, said improvement comprising:

said drive shafts are flexible

a recess in the exterior of the body adjacent to one end of the drive shafts;

a guide member located in said recess on the body having a pair of spaced holes extending therethrough generally parallel to the direction of movement of the piston;

a drill drive bushing rotatable in each said hole, having one end connected to said drive shafts and arranged on the other end to receive a drill bit; and,

releasable means for removably locating said guide member on the body whereby said guide member can be quickly and easily exchanged to provide preselected spacings between said holes.

4,286,903

TOOL ASSEMBLY FOR REPAIRING AND IN PARTICULAR GRINDING A TAP SEAT

Jean-Pierre Eckendorff, 29 Rue Aristide Briand, 27007 Evreux, France

Filed Nov. 20, 1979, Ser. No. 96,070

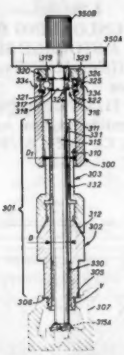
Claims priority, application France, Nov. 21, 1978, 78 32802; Oct. 22, 1979, 79 26120

Int. Cl.³ B23B *41/00*

U.S. Cl. 408—83.5 **17 Claims**

1. A tool assembly for repairing and in particular grinding a tap seat, comprising a cutting tool carrier shaft, a guide carrying said shaft and an adapter carrying said guide, the adapter having an end portion forming a replica of the tap head normally associated with the tap body, with a screwthread which is complementary to that of said tap body, said end portion

having mounted thereon a casing member comprising a screwthread for fixing and forwardly moving the guide, comprising a skirt portion with, at a terminal part, a thrust bearing for the tool carrier shaft, and having in its interior a screwthread capable of co-operating with said fixing and forward feed screwthread, the tool carrier shaft extending beyond the bearing to the operating means provided at its free end, characterised in that the thrust bearing comprises a double-acting ball-



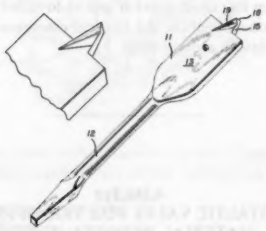
bearing thrust means whose outer race is fixed with respect to the guide while the inner race is fixed with respect to the tool carrier shaft which is arranged for that purpose, thereby to provide for axial fixing without play of the tool carrier shaft with respect to the guide, and further characterised in that at the same time the radial guiding action in respect of the tool carrier shaft is provided by means of at least one anti-friction ring which is broached after being force-fitted into one or other of the end portion-casing member components.

4,286,904

WOOD BIT

L. Steven Porter, Shrewsbury, and Raymond A. Stockley, Dudley, both of Mass., assignors to Parker Manufacturing Company, Worcester, Mass.

Filed Jul. 16, 1979, Ser. No. 57,662
Int. Cl.[3] B23B *51/00*; B27G *15/00*
U.S. Cl. 408—225 **5 Claims**



1. A spade-type bit comprising:
(a) a body defined by two parallel broad surfaces and two narrow side surfaces extending between said two broad surfaces,
(b) a spindle extending from a rearward end of said body,
(c) a point extending from a forward end of said body, said point being defined by said two broad surfaces and by two second side surfaces, said second side surfaces converging forwardly and intersecting to form a forward edge, and
(d) a groove formed in one of said broad surfaces along said point and extending generally parallel to one of said second side surfaces and intersecting the other one of said second side surfaces, an edge of said one second side surface adjacent said groove being maintained, said groove forming a positive rake angle, said groove gradually increasing substantially uniformly in depth and width toward said other one of said side second surfaces.

4,286,905

METHOD OF MACHINING STEEL, MALLEABLE OR NODULAR CAST IRON

Shyam K. Samanta, Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 30, 1980, Ser. No. 145,164
Int. Cl.[3] B23C *1/00*; C04B *35/10, 35/58*
U.S. Cl. 409—132 **4 Claims**

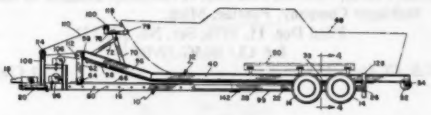
1. A method of removing stock from a metal part comprised of steel, malleable cast iron or nodular cast iron, comprising:
(a) establishing a relative motion between said part and a cutting tool formed of a substantially fully dense hot pressed ceramic material consisting essentially of a generally uniform mixture of 50–70% by weight Al_2O_3 and the remainder substantially Si_3N_4;
(b) advancing said tool into the surface of said part at a predetermined depth of cut and feed rate which results in the removal of stock from the part during periods of said relative movement.

4,286,906

ADJUSTABLE BALANCE, EXTENSION BOAT TRAILER

Merrill L. Robertson, 3244 McGraw St., San Diego, Calif. 92117

Continuation-in-part of Ser. No. 862,743, Dec. 21, 1977, abandoned. This application Aug. 27, 1979, Ser. No. 69,727
Int. Cl.[3] B60P *3/10*
U.S. Cl. 414—477 **11 Claims**



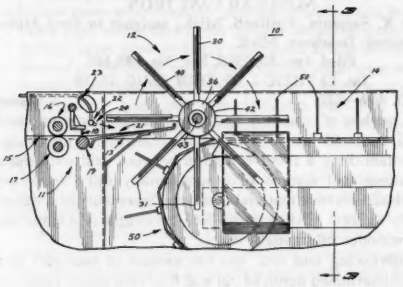
1. An adjustable balance, extension boat trailer, comprising:
an elongated chassis having a rear frame portion with supporting wheels thereon, and boom extending longitudinally forwardly from the frame with hitch means thereon for attachment to a towing vehicle;
primary support rollers mounted on opposite sides of said frame in substantially vertical alignment, along the longitudinal axis of said chassis, with the center of support of said wheels;
an elongated carriage mounted on said chassis with longitudinal side rails spaced to ride on said primary support rollers;
unloading and loading means on said chassis for respectively extending said carriage rearwardly from and retracting the carriage forwardly on to the chassis;
the forward ends of said side rails having upwardly inclined ramp portions for riding on said primary support rollers and lowering the carriage close to the ground in the rearwardly extended position of the carriage;
said carriage having a rear end portion with a ground engaging rear roller rotatably mounted thereon;
said carriage having a forward portion with a front roller rotatably mounted thereon;
said boom having longitudinal guide means for receiving said front roller;
and said carriage having means for supporting and securing a boat thereon.

4,286,907

GRID EXTENSIONS ON A ROTARY STACKER

Philip J. Houle, Smithfield, R.I., and Robert G. Oliver, South Dartmouth, Mass., assignors to Gloucester Engineering Co., Inc., Gloucester, Mass.

Filed Sep. 17, 1979, Ser. No. 76,384
Int. Cl.[3] B65G 57/08; B65H 29/40
U.S. Cl. 414—72 6 Claims



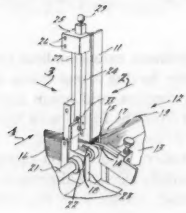
6. Means for reducing turbulence, in a stacking machine for plastic film workpieces in which the pieces are transported sequentially by radial arms rotated jointly about an axis and releasably secured to the ends of said pieces, said means comprising extension means secured to at least one of said arms and extending therefrom in the direction of said axis away from the other arm.

4,286,908

DEVICE FOR FACILITATING SEPARATION OF SHEET GROUPS

Ernst Pfäffle, Neuffen, Fed. Rep. of Germany, assignor to Hans Sickinger Company, Pontiac, Mich.

Filed Dec. 11, 1978, Ser. No. 968,272
Int. Cl.[3] B65G 59/06
U.S. Cl. 414—115 1 Claim



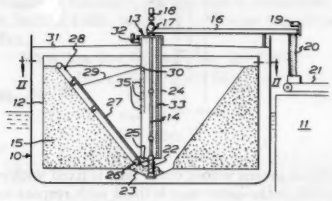
1. A device comprising, in combination, guide means for retaining a stack of sheets, a rotating slotted disk supporting said sheets, a finger and depressor at one corner of said sheets for periodically separating a sheet group at the bottom of the stack for entry into a disk slot, means for maintaining constant downward pressure on said corner of the stack comprising a vertically slidable weight mounted at said corner, a pressure bar movably mounted at the lower end of said weight and engageable with the top of said stack, and means for lifting said weight upwardly, said pressure bar being so shaped as to retract into non-interfering relation with sheets above it when said weight is lifted and move into stack-engaging position after said pressure bar has been lifted above the top of the stack, said pressure bar having a flat lower edge and an inclined inner edge facing said stack, whereby said bar will be cammed into non-interfering relation with the stack when the weight is lifted, said bar being counterweighted, and stop means on said bar and weight whereby the bar will be moved into stack-engaging position after being lifted above the top of the stack.

4,286,909

APPARATUS FOR UNLOADING BULK MATERIAL FROM A STORAGE SPACE

Karl A. L. Tingskog, Helsingborg, Sweden, assignor to AB Siwertell, Bjuv, Sweden

Filed Apr. 11, 1979, Ser. No. 29,090
Claims priority, application Sweden, Apr. 12, 1978, 7804113
Int. Cl.[3] B65G 65/38
U.S. Cl. 414—144 9 Claims



1. An apparatus for unloading bulk material from a storage space such as a cargo hold or a silo, the apparatus comprising a vertical conveyor whose inlet end is located proximal the bottom of the storage space, and a scraper device which is operable to scrape the bulk material in a direction towards the inlet end of the vertical conveyor and which is swingable about the vertical axis of the conveyor, said scraper device having one end pivotally journaled proximal the inlet end of the vertical conveyor for movement between a raised position in which the scraper device extends upwardly substantially along the vertical conveyor, and a lowered position in which the scraper device extends along the floor of the storage space, said scraper device being telescopically extensible, a protective tube disposed about the vertical conveyor, said scraper device being pivotally journaled on said protective tube for movement between its raised position and its lowered position, said tube being rotatable about the vertical conveyor for swinging the scraper device around same.

4,286,910

PERISTALTIC VALVE FOR TRANSFERRING MATERIAL BETWEEN ZONES

Lucas J. Conrad, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Feb. 28, 1980, Ser. No. 125,730
Int. Cl.[3] F16K 7/10
U.S. Cl. 414—221 10 Claims

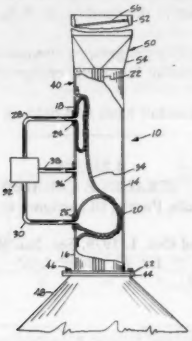
4. A valve for transferring material between first and second zones having first and second fluid atmospheres, respectively, comprising:

(a) a housing;

(b) first and second sealing means secured in a spaced relationship in said housing for co-acting with the housing to seal the valve and prevent the passage of fluids between said first and second zones; and

(c) envelope means circumscribing said first and second

sealing means for forcing the fluid from said space between said sealing members, said envelope means and said



first and second sealing means functioning at selected times during the operation of the valve.

4,286,911

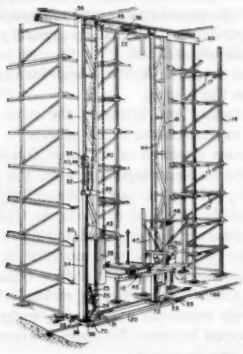
SEMI-AUTOMATED WAREHOUSING SYSTEM

John W. Benjamin, Lancaster, Pa., assignor to Litton Systems, Inc., Florence, Ky.

Division of Ser. No. 882,070, Feb. 28, 1978, Pat. No. 4,252,212. This application Jun. 6, 1979, Ser. No. 45,956

Int. Cl.³ B65G *65/00, 1/00*

U.S. Cl. 414—273 **13 Claims**



1. A stacker crane with a transfer vehicle disposed thereon for a deep-storage warehousing system comprising in combination,

(I) A stacker crane including

(a) spaced masts,

(b) a headpiece and a base joining said masts together at the top and bottom thereof,

(c) wheels joined to said headpiece and to said base and adapted to ride along tracks located proximate thereto,

(d) an elevator spanning the space between said masts,

(e) a hydraulic cylinder and a piston extensible therefrom,

(f) a movable sheave nest secured to the free end of said piston,

(g) chain means fixed at one end to said masts and fixed at the other end to said elevator with the intermediate length passing about said movable sheave,

(h) guide rails secured to the upper surface of said elevator, and

(i) a hydraulic system for driving said piston relative to said cylinder to shift said movable sheave relative to said chain means and thereby alter the position of said elevator, and

(II) A transfer vehicle including

(a) a box-like body,

(b) a cover plate,

(c) a plurality of wheels secured to the sides of said vehicle so that said vehicle can rest on the guide rails on said elevator,

(d) hydraulic means disposed within the interior of said body for raising and lowering the cover plate, and

(e) motor means and a battery pack for powering said motor means disposed within the interior of said transfer vehicle for driving said wheels so that said vehicle can travel along said guide rails on said elevator;

wherein stop members are secured to the opposite edges of the elevator perpendicular to the guide rails, and stop bars are secured to the underside of the transfer vehicle, said bars engaging said members to prevent continued movement of the transfer vehicle relative to the elevator when the transfer vehicle exits the guide rails at an angle to the horizontal.

4,286,912

PROCESS AND APPARATUS FOR CHARGING AND SEALING A CHARGING PORT OF A CHAMBER

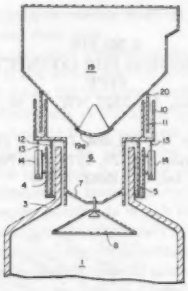
Manfred Galow, and Wilhelm Busbach, both of Essen, Fed. Rep. of Germany, assignors to Didier Engineering GmbH, Essen, Fed. Rep. of Germany

Filed Mar. 26, 1979, Ser. No. 24,041

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1978, 2815739

Int. Cl.³ C10B *31/02*

U.S. Cl. 414—287 **24 Claims**



1. An arrangement for closing a charging port of a chamber, particularly of a cooling chamber for dry coke cooling, said arrangement comprising:

a drivable member adapted to be movably mounted adjacent a chamber charging port to be closed;

an outer cover movable between a closed position in sealing engagement with said drivable member and sealingly closing the top thereof and an open position away from said drivable member;

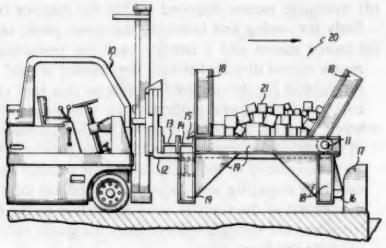
an inner cover supported by said drivable member and movable thereby between a sealing position whereat said inner cover is adapted to seal against a surface of the chamber charging port which faces generally away from said outer cover and an open position spaced from such surface; and a material supply container movable into position in sealing contact with said drivable member and sealingly closing the top thereof when said outer cover is in said open position away from said drivable member.

4,286,913

DUMPABLE CROP BAR CONTAINER

Joseph R. Rowe, Carrollton, and Eugene T. Sanders, Newnan, both of Ga., assignors to Southwire Company, Carrollton, Ga.

Filed Nov. 13, 1979, Ser. No. 93,341
Int. Cl.³ B66F *9/19*
U.S. Cl. 414—422 **8 Claims**



1. An apparatus for receiving, transporting and dumping pieces of bar with the assistance of a cooperating forklift truck, having extending fork arms, and adapted to contact a stationary curb which comprises:

rigid receptacle and front stanchion means for holding crop bar pivotally connected to;

yoke and rear stanchion means for pivotally holding said receptacle and front stanchion means; and

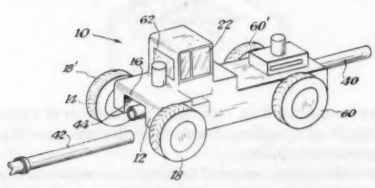
pivot means connecting the front of said receptacle and front stanchion means to the front of said yoke and rear stanchion means whereby bar may be dumped from said apparatus by contacting said receptacle and front stanchion means with said stationary curb forcing said receptacle and front stanchion means to rotate about said pivot means from a receiving position through an arcuate path to a terminal dumping position thereby causing bar to fall from said apparatus.

4,286,914

MEANS AND METHOD FOR CONNECTING LARGE PIPE

Douglas M. Davidson, Jr., 5320 NW. 16 St., Lauderhill, Fla. 33313

Continuation of Ser. No. 861,404, Dec. 16, 1977, abandoned. This application Sep. 20, 1979, Ser. No. 77,311
Int. Cl.³ B66F *11/00*
U.S. Cl. 414—460 **7 Claims**



3. A fast method for laying, connecting, disconnecting and removing conduit comprised of the steps of:

arranging a pair of vertically movable conduit holding means to hold a conduit longitudinally below the supporting structure of a motorized vehicle in order to pick up the conduit,

independently moving each said holding means vertically to releasably grasp the conduit and raise each end of said conduit in a vertical plane while said conduit is grasped by said holding means to fix the relative position between said conduit and said vehicle when connecting the conduit to a previously placed conduit, said holding means is moved toward and away from said vehicle, and

moving and steering the motorized vehicle in a colinear direction toward a previously placed conduit, while independently grasping and adjusting the height of the conduit in said holding means to align the center line of the conduit in respect to the center line of the previously placed conduit,

forcibly connecting the grasped conduit into said previously positioned conduit by kinetic energy of the moving vehicle,

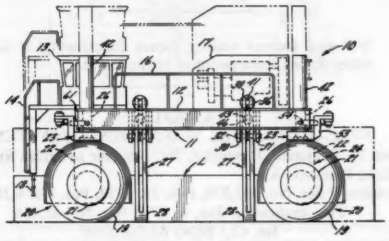
releasing said conduit from said holding means.

4,286,915

STRADDLE CARRIER

William L. LaBerdia, Peoria, Ill., assignor to Kress Corporation, Brimfield, Ill.

Filed Oct. 1, 1979, Ser. No. 80,283
Int. Cl.³ B60P *1/02*
U.S. Cl. 414—460 **7 Claims**



1. A straddle carrier for heavy loads comprising:

a plurality of spaced-apart, ground-engaging wheels, the relative positions of the wheels generally defining a loadencompassing area;

a main frame supported by the wheels for vertical movement relative to the wheels;

means for raising and lowering the main frame and the gripping means relative to the wheels;

gripping means mounted on the main frame for gripping a load in the load-encompassing area, the gripping means comprising at least one pair of opposed gripping members each pivotally mounted to the main frame, each of the gripping members having an upwardly extending portion beyond the point of pivotal connection to the main frame and a downwardly extending portion beneath the point of pivotal connection, the gripping means further comprising a selectively extensible hydraulic cylinder and associated rod connected between the upper portions of the pair of opposing members; and

stabilizing means connected between one of the gripping members and the main frame to prevent the pivoting of said one member relative to the main frame and thereby prevent relative movement between the members, a gripped load and the main frame while the carrier is in motion.

4,286,916

POWER OPERATED MECHANISMS FOR ACTUATING SWINGING ARMS

Gerald P. Evans, Dunderhole Farm, Bishopswood, Ross-on-Wye, Herefordshire, England

Filed Jul. 17, 1979, Ser. No. 58,200
Int. Cl.³ B60P *1/00*; B65F *1/00*
U.S. Cl. 414—546 **12 Claims**

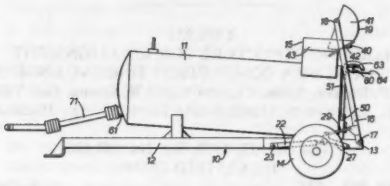
1. Apparatus for spreading slurry or liquid manure comprising:

a chassis having wheels that extend below the chassis;

a tank for the slurry or manure defining an upwardly facing

slurry or manure input and having means for discharging the slurry or manure;

means for mounting the tank on the chassis; and means for loading the slurry or manure from a sunken pool into the tank, the loading means comprising a main swinging arm having a pivot at one end and a bucket at its outer end, and a power operated mechanism for causing pivotal movements of said swinging arm, the mechanism comprising a reciprocating fluid-actuated ram having one element connected to an anchorage, a pivotal linkage connecting the other element of the ram to a point on the swinging arm displaced from said pivot, and means for guiding a part of said pivot linkage to move in a path remote from the main swinging arm, the arrangement being such that the mechanism can move the swinging arm from a first position in which the outer end of the swinging arm is below the lowermost point of the wheels and a second position in which the bucket discharges its contents into the tank through the input.

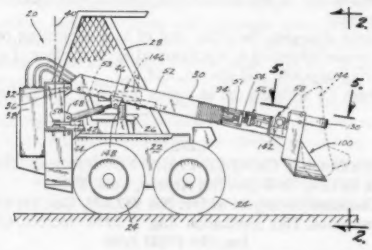


4,286,917

BOOM MOUNTED CARRIER FOR HANDLING BEEF QUARTERS AND THE LIKE

Thomas C. Mehesan, Jr., Hospers, Iowa, assignor to Banner Industries, Inc., Hospers, Iowa

Filed Aug. 20, 1979, Ser. No. 68,202
Int. Cl.³ B66C *1/22, 1/42*
U.S. Cl. 414—704 **8 Claims**



1. A carrier apparatus adapted to be mounted on an elongated boom arm for handling beef quarters and like loads, comprising,

an upstanding rear wall structure having forward and rearward surfaces, upper and lower ends and opposite sides,

support means on the rearward side of said wall structure for securing said wall structure to a boom arm,

a load support platform operatively connected to said rear wall structure adjacent the lower end thereof and extended forwardly therefrom,

a side member operatively connected to and extended forwardly from one side of said rear wall structure, and

gate means operatively supported on said rear wall structure for movement between a loading position wherein said gate means is displaced from the forward surface of said wall structure so that a load may be received on said platform in leaning engagement against said rear wall, and a carrying position wherein said gate means is extended forwardly of and laterally across the forward surface of said wall structure for at least partially enclosing a load between said side member, wall structure and gate means,

said rear wall structure being generally arcuate in top cross-section, the forward surface thereof being concave,

said gate means substantially conforming to the rearward surface of said wall structure, and

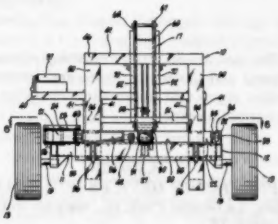
said gate means being circumferentially moved relative to said wall structure between the loading and carrying positions therefor whereby in the loading position, said gate means is positioned substantially rearwardly of said wall structure.

4,286,918

IMPLEMENT TRANSPORTER

Jefferson C. Shannon, P.O. Box 808, Yazoo City, Miss. 39194

Filed Jun. 26, 1979, Ser. No. 52,145
Int. Cl.³ B60P *3/00*
U.S. Cl. 414—742 **12 Claims**



1. An implement transporter including a trailer, comprising:

(a) two rear wheels on axes of rotation for carrying the trailer,

(b) a lifting mechanism for lifting an implement carried by the trailer,

(c) an arm carrying the lifting mechanism, the arm having first and second ends, and

(d) pivot means pivotably connecting the first end of the arm to the trailer at one side at the rear of the trailer, the lifting mechanism holding the implement with its center of gravity spaced transversely of the trailer from the pivot means in a direction toward the second arm end when the arm is in a lifting position, the arm being pivotable from the lifting position in which the lifting mechanism holds the implement substantially transverse to the rear of the trailer and to a transport position in which the lifting mechanism holds the implement longitudinally of the trailer with the center of gravity of the implement located forwardly of the pivot means and the axes of said rear wheels.

4,286,919

APPARATUS FOR PUMPING OPERATION OF A HYDRAULIC MACHINE HAVING FRANCIS TYPE RUNNER

Yuzo Yamaguchi, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 13, 1979, Ser. No. 103,385
Int. Cl.³ F01D *3/00, 11/02*
U.S. Cl. 415—112 **5 Claims**

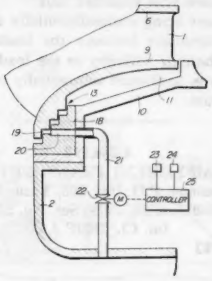
1. An apparatus for pumping operation of a hydraulic machine having a Francis type runner constituted by a crown ring, a shroud ring and a plurality of blades interposed therebetween, characterized by comprising:

a multi-stage seal including a plurality of seal stages defined between the inner peripheral surface of said shroud ring and a stationary part opposing to said inner peripheral surface of said runner;

pressure attenuation chambers disposed between adjacent

seal stages and adapted to attenuate the pressures of water having passed respective seal stages;

a water extracting pipe opening to at least the pressure attenuation chamber second from the final and adapted to release the pressurized water from said attenuation chamber; and



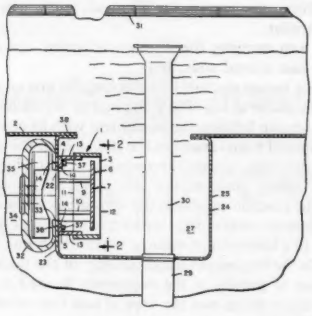
a valve disposed in said water extracting pipe and adapted to be opened and closed to permit and interrupt the water extraction from said attenuation chamber through said water extracting pipe.

4,286,920

PROTECTOR DEVICES FOR DRAINS

Erik O. Vilen, La Grange Park, Ill., assignor to G. S. Blakeslee & Co., Cicero, Ill.

Filed Jun. 25, 1979, Ser. No. 51,619
Int. Cl.³ F01D *25/00*
U.S. Cl. 415—121 G **11 Claims**



4. A protector device for use in a machine embodying a wall having a drain opening therethrough, a pump mounted on the exterior of said wall for pumping liquid from the interior of said machine, said pump having an inlet opening disposed in position to receive fluid from the interior of said machine through said drain opening, said protector device being for the purpose of preventing elongated articles from entering said drain opening from the interior of said machine and comprising

a. an annular member having two axially spaced outer edges,

b. means for supporting said annular member on the interior of said wall in position wherein

(1) said annular member is disposed in substantially axial alignment with said drain opening, and

(2) one of said edges is disposed in outwardly spaced, facing relation to the interior of said wall to define a passageway between said one edge and said wall for the passage of fluid from outwardly of said annular member into said drain opening,

c. said annular member being of greater cross-sectional width, than said drain opening, v , said annular member is so disposed on said wall, and

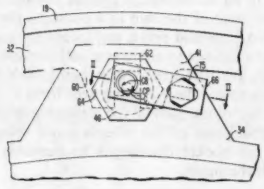
d. a baffle member disposed in said annular member in position to define with said annular member, a passageway through the interior of said annular member, radially outwardly of said drain opening, for the passage of fluid through said annular member from outside the other of said edges for passage between said annular member and said baffle member into said drain opening, when said annular member is so disposed on said wall.

4,286,921

LOCKING STRUCTURE FOR AN ALIGNMENT BUSHING OF A COMBUSTION TURBINE ENGINE

John P. Donlan, Aston, Pa., and Alfred R. Krauss, Oak Valley, N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 13, 1979, Ser. No. 103,136
Int. Cl.³ F01D *25/24*
U.S. Cl. 415—136 **5 Claims**



1. In an adjustable mounting arrangement between an axially facing adjacent arcuate seal ring and an inner shroud of a combustion turbine engine to permit concentric alignment of the seal ring with an adjacent rotor, means for locking said adjustable arrangement in a final concentric position, wherein said mounting arrangement includes an axially extending rotatable bushing in said seal ring and a pin, offset from the center of rotation of said bushing, projecting axially through said bushing and having one end slidably received within a radially extending slot in said shroud and wherein said locking means comprises:

means engaging the other end of said projecting pin, said means extending to a position adjacent the face of said seal ring opposite said shroud; and,

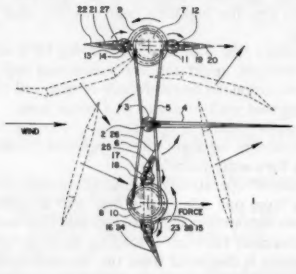
means for securing the engaging means to said sealing face.

4,286,922

VARIABLE CAMBER FLUID POWER MACHINE

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 952,471, Oct. 18, 1978, abandoned. This application Aug. 2, 1979, Ser. No. 63,141
Int. Cl.³ F03D *3/06*
U.S. Cl. 416—17 **5 Claims**



1. A variable camber fluid power machine for converting the

kinetic energy of the moving fluid stream to a useful mechanical energy in the form of rotating motion with a torque, said variable camber fluid power machine comprising:

(a) a central shaft having means for indexing the angular position of said central shaft about the axis of said central shaft relative to the fluid stream direction;

(b) a plurality of arms extending axisymmetrically from said central shaft, said plurality of arms being rotatable about said central shaft;

(c) a plurality of oblong blades, each of said plurality of oblong blades rotatably disposed to the extremity of each of said plurality of arms wherein each of said plurality of oblong blades is allowed to revolve about said central shaft and at the same time is rotatable about the center line of each of said plurality of oblong blades, said center line being generally parallel to said central shaft;

(d) a first plurality of mechanical transmission means linking the rotating motion of each of said plurality of oblong blades about the center line of each oblong blade to the revolving motion of said oblong blade about said central shaft relative to said central shaft wherein each of said plurality of oblong blades rotates at an angular velocity equal to one half of the angular velocity of the revolving motion of said oblong blade about said central shaft wherein each of said plurality of oblong blades takes a position generally tangential to the revolving path of said oblong blade at the minimum drag position and takes a position generally perpendicular to said revolving path at the maximum drag position, said maximum drag position being diametrically located to said minimum drag position with respect to said central shaft;

(e) a plurality of pair of flaps, each of said pair of flaps pivotably attached to each edge of each of said plurality of oblong blades, each of said flaps being pivotable about axis parallel to the edge of said oblong blade; and

(f) a second plurality of mechanical transmission means linking the pivoting motion of each pair of said plurality of flaps to the rotating motion of each of said plurality of oblong blades wherein each pair of said flaps generally line up with said oblong blade to which said pair of flaps are attached, at 0 degree, 120 degree and 240 degree revolving positions about said central shaft, said revolving positions measured from said minimum drag position in the direction of the revolving motion of said plurality of oblong blades about said central shaft, and are deflected toward to one another at other revolving positions providing a camber to the blade-flaps assembly creating an additional lift force to generate a torque about said central shaft in the direction of the revolving motion of said blade-flaps assembly about said central shaft wherein the maximum camber is provided at 60 degree, 180 degree and 300 degree revolving positions, said revolving positions measured in said manner.

4,286,923

OVERLOAD PROTECTION DEVICE FOR A PROPELLER DRIVE ENGINE

Harald Gross, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Dec. 29, 1978, Ser. No. 381

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1978, 2800227

Int. Cl.³ B63H *1/10*

U.S. Cl. 416—43 **10 Claims**

1. A device for controlling the pitch of a propeller that is driven by an engine, wherein the propeller is of the type permitting cycle adjustment of the propeller blades, the device comprising:

a connecting push rod connected to the propeller such that the shifting of the push rod in a first direction changes the pitch of the propeller in a respective first direction of pitch, and shifting of the push rod in the first opposite direction changes the pitch of the propeller in the opposite direction of pitch thereof;

a servomotor including an axially shiftable first piston connected with the push rod for moving the push rod in the first direction and the first opposite direction as the first piston shifts in a second direction and second opposite direction, respectively; the servomotor including first piston shifting means operable for shifting the first piston in its second direction and including second piston shifting means operable for shifting the first piston in its second opposite direction;

a control valve including a control pin and connected with the first and second piston shifting means such that movement of the control pin in a third direction operates the first piston shifting means and movement of the control pin in the third opposite direction operates the second piston shifting means;

an adjustment device connected with the control pin for selectively moving the control pin in the third direction and the third opposite direction thereof; the adjustment device comprising:

means for sensing the load on the engine driving the propeller to rotate and for delivering a signal dependent upon the load on that engine;

a reversing valve connected for receiving the signal from the load sensing and signal delivering means; the reversing valve also being connected with the adjustment device; the reversing valve having a first condition thereof at which the reversing valve is connected to the adjustment device for causing the adjustment device to move the control pin in the third direction and also for transmitting the load dependent signal to the adjustment device for enabling operation of the adjustment device proportional to the load dependent signal; the reversing valve having a second condition thereof at which the reversing valve is connected to the adjustment device for causing the adjustment device to move the control pin in the third opposite direction and also for transmitting the load dependent signal to the adjustment device for enabling operation of the adjustment device proportional to the load dependent signal;

a wedge pathway member connected with the servomotor first piston for moving therewith; the wedge pathway member defining a pathway that is oblique to the pathway traveled by the wedge pathway member as it moves along with the servomotor piston; the reversing valve including an operator thereof which rides along the wedge pathway of the wedge pathway member as the wedge pathway member moves with the servomotor piston with respect to the operator riding thereon; as the operator rides in a fourth direction along the wedge pathway, the operator shifts the reversing valve to the first condition thereof, as the operator rides in the opposite fourth direction along the wedge pathway, the operator shifts the reversing valve to the second condition thereof.

4,286,924

ROTOR BLADE OR STATOR VANE FOR A GAS TURBINE ENGINE

Anthony G. Gale, Wollaton, England, assignor to Rolls-Royce Limited, London, England

Filed Dec. 13, 1978, Ser. No. 968,928

Claims priority, application United Kingdom, Jan. 14, 1978, 01552/78

Int. Cl.³ F01D *5/18*

U.S. Cl. 416—97 R **5 Claims**

1. An aerofoil blade or vane for a gas turbine engine comprising:

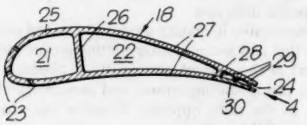
a hollow aerofoil portion fabricated from two separately cast elements and having an interior cooling passage for receiving a supply of cooling fluid, said aerofoil portion having an exit passage of minimum thickness along its

trailing edge communicating with said interior passage for discharge of the cooling fluid therefrom;

one of said separately cast elements including a nose portion, spaced convex and concave side walls extending from said nose portion, and a flank extending from one of said side walls and forming a portion of the trailing edge;

a joint face formed by said flank and by a rear edge of the other of said walls;

said other of said cast elements forming a second flank for



the other of said side walls when attached to said one of said cast elements at said joint face, said second flank being a minor portion of the other of said side walls and forming another portion of said trailing edge and being separated from said first flank to define said exit passage for the cooling fluid along the trailing edge; and

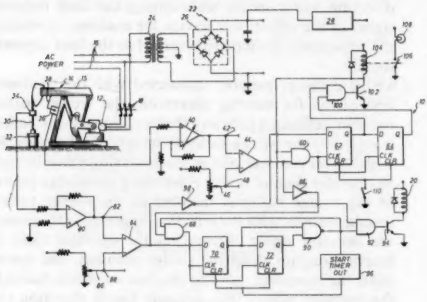
means metallurgically attaching the other of said cast elements to said first cast element to form the aerofoil portion of the blade or vane with said exit passage of the trailing edge being of minimum thickness.

4,286,925

CONTROL CIRCUIT FOR SHUTTING OFF THE ELECTRICAL POWER TO A LIQUID WELL PUMP

Thomas R. Standish, Houston, Tex., assignor to Delta-X Corporation, Houston, Tex.

Filed Oct. 31, 1979, Ser. No. 89,844
Int. Cl.³ F04B *49/00*
U.S. Cl. 417—12 **5 Claims**



4. A control circuit for shutting off the electrical power to the drive motor which reciprocates the polished rod of a liquid well pump comprising,

load measuring means connected to the polished rod measuring the load in the polished rod,

position measuring means for measuring the position of the polished rod in the well,

a first comparator connected to the load measuring means measuring the polished rod load relative to a preset load point,

a second comparator connected to the positioned measuring means measuring the polished rod position relative to a preset position,

switching means controlling the power to the motor and connected to the outputs of said first and second comparators for shutting off the power when the load is greater than the preset load, and the position is equal to the preset position on the downstroke,

said switching means comprises,

an inverter connected to the output of the second comparator,

an AND gate connected to the output of the inverter,

a two-stage D type latch having clock input connected to the output of the AND gate, the D input of the D type latch connected to the output of the first comparator,

a NAND gate connected to the outputs of the D type latch,

a second AND gate connected to the output of the NAND gate,

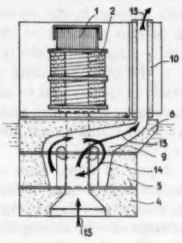
a power switch connected to and controlled by the second AND gate and in turn controlling the power to the motor.

4,286,926

CONDUCTION PUMP FOR LIQUID METAL

Richard Deshais, Paris, and Henri Carbonnel, Antony, both of France, assignors to Novatome, Le Plessis Robinson, France

Filed Oct. 31, 1979, Ser. No. 90,081
Claims priority, application France, Nov. 15, 1978, 78 32279
Int. Cl.³ H02N *4/20*
U.S. Cl. 417—50 **4 Claims**



1. A conduction pump for liquid metal comprising: a part of refractory material immersed in liquid metal defining a circulating pipe for said metal, in which one part is defined by a channel of flat shape where the metal circulates from bottom to top, said circulating pipe forming a vertical coil for liquid metal comprising a member in communication with the liquid metal circulating in said channel; a single magnetic circuit, having an air gap in the interior of which said channel passes and being surrounded at least partially by the coil, at the level of the air gap; at least another coil fed by alternating current creating a magnetic field in a horizontal direction in the air gap and causing circulation in said coil, of an induced current which circulates at the level of said channel in a horizontal direction perpendicular to the magnetic field and a vertical force which is directed toward the top, being produced by the joint action of said field and current, on the metal in said channel.

4,286,927

HYDRAULIC POWER TRANSFER UNIT

Wilfred E. Boehringer, Fullerton, Calif., assignor to McDonnell Douglas Corporation, Lakewood, Calif.

Filed Aug. 14, 1978, Ser. No. 933,558
Int. Cl.³ F04B *1/16, 17/00, 35/00*
U.S. Cl. 417—271 **5 Claims**

1. A reciprocating hydraulic power transfer unit for transfering hydraulic energy between first and second hydraulic systems each having a pressure side and a return side comprising:

a central axis;

a plurality of cylinders spaced about said central axis;

a plurality of first and second pistons connected back to back and mounted for sliding movement within said cylinders;

mechanical piston phase control means operatively connected to said pistons for holding said pistons in a constant relative positional relationship with each other; and

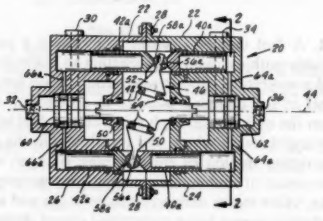
hydraulic valve means coupled to said phase control means and arranged to connect the pressure sides of the first and second systems to act on said back to back pistons in at least one of said cylinders at a time in a cyclic sequence and simultaneously to connect the return sides of the first and second systems to act on said back to back pistons in at least one of said cylinders which are substantially diametrically opposite to said cylinders connected to the pressure side, whereby said unit is capable of operating as a motor and a pump, and fluid from the pressure line of the system with a predetermined greater pressure than the other system is operative to drive successive ones of said pistons in one direction while the connected back to back piston pressurizes the fluid in the pressure side of the other system, while opposite pistons are constrained by said phase control means to return in a reverse direction, said mechanical phase control means including:

a central shaft located on said central axis substantially symmetrically with respect to said pistons;

a connector ring having a plurality of substantially coplanar radial arms;

means for coupling said radial arms with corresponding ones of said pistons; and

bearing means connecting said central shaft to said connector ring in such a way as to maintain the plane of said radial arms at a fixed angle with respect to said central axis but allowing said plane and said connector ring to wobble about said axis, whereby the positions of said pistons are interdependent and movement of one pair of back to back pistons results in corresponding movement



of the others to maintain a constant phase relationship between said pistons, said hydraulic valve means including at least one rotary valve having:

a valve body defining an interior cylindrical surface and an area therewithin;

a pressure port in communication with said cylindrical surface area;

a return port in communication with said cylindrical surface area;

a plurality of flow passageways, each communicating the fluid acted upon by a piston pair to said cylindrical surface area; and

a central valve member connected to said mechanical piston phase control means and mounted for rotation in said cylindrical surface area adapted to cyclically switch said flow passageways to communicate with said pressure and return ports in a preselected order, said central valve member including:

a main pressure chamber in communication with said pressure port;

a main return chamber in communication with said return port; and

a divider portion positioned to communicate generally half of said flow passageways with said main pressure chamber and generally the other flow passageways with said return chamber, said divider portion including:

a pair of vanes positioned to slide over the locations at which said flow passageways terminate at said interior cylindrical surface; and

a pair of orifices defined by said divider portion in which said vanes are mounted, said vanes each including:

a cylindrical main body portion having a vane passageway formed therethrough;

a cylindrical vane portion connected to said cylindrical main body portion at the end thereof which extends toward said interior cylindrical surface and concentric therewith;

a ring shaped surface formed on said cylindrical vane portion whose inner diameter is the same as the diameter of said cylindrical main body portion, said ring shaped surface having a surface contour which matches the contour of said interior cylindrical surface; and

means to apply the pressure in the pressure line beneath said ring shaped surface so that the area thereof determines the force with which said ring shaped surface is held against said interior cylindrical surface.

4,286,928

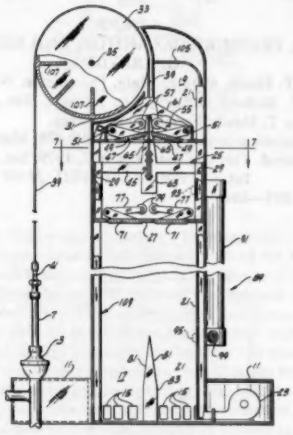
PUMPING UNIT

Robert A. Clay, Tustin, Calif., assignor to Robert R. Hermann, St. Louis, Mo.

Continuation-in-part of Ser. No. 721,039, Sep. 7, 1976, abandoned. This application Jan. 22, 1979, Ser. No. 5,179

Int. Cl.[3] **F04B** *17/00;* **F03G** *3/04*

U.S. Cl. 417—329 **12 Claims**



4. A pumping unit for removing oil or the like from a well, the unit comprising a tower, a sump at the bottom of the tower, a reservoir at an elevation above the sump, conduit means interconnectng the sump and the reservoir, means for pumping a liquid via the conduit means from the sump up to the reservoir, a wheel mounted on the tower for rotation about a generally horizontal axis at an elevation above that of the bottom of the reservoir, a line extending over the wheel for attachment at one end to a polished rod load outside the tower in the well, a receptacle inside the tower attached to the other end of the line and serving as a counterweight for the polished rod load, the receptacle being reciprocally movable up and down in the tower between the reservoir and the sump, the reservoir having an outlet and valve means for the outlet, means for opening said reservoir valve means solely in response to the receptacle, in moving upwardly, reaching a first predetermined intermediate position, said receptacle continuing to move upwardly for an interval during which liquid is transferred from the reservoir to the receptacle in an amount sufficient to make the combined weight of the receptacle and the liquid therein

greater than that of the polished rod load, the receptacle automatically reversing its direction and moving downwardly when said combined weight is greater than that of the polished rod load, said reservoir valve means closing as the receptacle descends, said reservoir valve means and reservoir valve opening means being responsive to change in magnitude of said load from one cycle of pumping operation to another for varying the amount of liquid transferred from the reservoir to the receptacle from said one cycle to the other as needed to effect the downward movement of the receptacle in the tower, and the receptacle having an outlet and valve means for the outlet, means for opening the receptacle valve means solely in response to the receptacle, in moving downwardly, reaching a second predetermined intermediate position below said first predetermined intermediate position, said receptacle continuing to move downwardly for an interval during which liquid is transferred from the receptacle to the sump in an amount sufficient to make the combined weight of the receptacle and any liquid remaining therein less than that of the polished rod load, said receptacle automatically reversing its direction and moving upwardly when said combined weight is less than that of the polished rod load, said receptacle valve means closing as the receptacle ascends, said receptacle valve means and receptacle valve opening means being responsive to change in magnitude of said load from one cycle of pumping operation to another for varying the amount of liquid transferred from the receptacle to the sump from said one cycle to the other as needed to effect the upward movement of the receptacle in the tower.

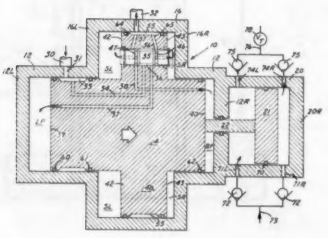
4,286,929
DUAL PRESSURE GAS MOTOR, AND METHOD OF OPERATION

Rodney T. Heath, 4901 E. Main, Farmington, N. Mex. 87401, and C. Richard Gerlach, San Antonio, Tex., assignors to Rodney T. Heath, Farmington, N. Mex.

Continuation-in-part of Ser. No. 780,479, Mar. 23, 1977, abandoned. This application May 7, 1979, Ser. No. 36,839

Int. Cl.³ F04B *17/00*; F01L *21/04*

U.S. Cl. 417—404 **9 Claims**



1. A method of operating a gas motor having a double acting, two stage piston assembly of a primary piston and a centrally mounted secondary piston, and having a single free slide valve freely reciprocably mounted in the secondary piston and arranged to pass gas from an inlet to a first side of the first stage piston and simultaneously passing gas from the second side of the first stage piston to the first side of the secondary piston, while exhausting gas from the second side of the secondary piston, comprising:

(a) completely closing the gas exhaust outlet from the first end of the secondary piston while the piston assembly is moving in a first direction,

(b) exhausting gas from the second end of the secondary piston while the piston assembly is moving in said first direction, and

(c) simultaneously admitting pressurized gas to the first end of the primary piston while exhausting gas from the second end of the secondary piston to product a gas pressure differential sufficient to fully move the slide valve by the gas pressure in the opposite direction while the piston assembly is moving in said first direction.

4,286,930
FUEL INJECTION SYSTEMS

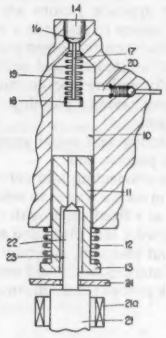
Boaz A. Jarrett, London, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Nov. 16, 1979, Ser. No. 94,902

Claims priority, application United Kingdom, May 11, 1979, 16438/79

Int. Cl.³ F04B *17/04*

U.S. Cl. 417—416 **5 Claims**



1. A fuel injection system comprising a pumping plunger slidable within a cylinder, actuating an outlet from the cylinder and a non-return valve in said outlet, means for effecting movement of the pumping plunger in a direction to displace fuel from the cylinder through said outlet, a fuel inlet to the cylinder and through which fuel can flow into the cylinder during the return motion of the pumping plunger as permitted by movement of said actuating means, a non-return valve in said inlet, valve means defined by the plunger and actuating means, said valve means being maintained closed during movement of the pumping plunger by the actuating means, and the system including a stop to limit the movement of the actuating means whereby in use, the pumping plunger will continue to move after the movement of the actuating means has been halted, so that the valve means will open to cause a reduction in the fuel pressure in said cylinder.

4,286,931
FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES, PARTICULARLY FOR DIESEL ENGINES

Walter Häfele, Fellbach, and Bernhard Schenk, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 15, 1979, Ser. No. 12,534

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1978, 2806477; Feb. 16, 1978, 2806478

Int. Cl.³ F02M *59/44*

U.S. Cl. 417—490 **5 Claims**

1. A fuel injection pump for internal combustion engines, particularly a plug-in pump having a drive side for diesel engines, comprising:

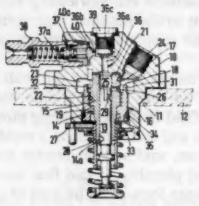
a housing defining a reception bore having a threaded opening to the drive side and a shoulder which is opposite the threaded opening and partly defining a suction chamber;

a cylindrical sleeve secured to the reception bore, said sleeve defining a pump piston bore within which a working chamber is defined, and a top portion of larger diameter within which at least one control bore is defined;

a pump piston mounted within the pump piston bore for

axial and rotational movement therein, said piston having a control edge which serves the purpose of varying the fuel delivery quantity and cooperates with said at least one control bore in said sleeve for varying the communications between the suction chamber and the working chamber; and

an annular screw which engages the reception bore opening such that the annular screw generates a force toward the



reception bore shoulder to clamp the top portion of the sleeve against the reception bore shoulder, wherein:

the annular screw includes a widened bore portion which surrounds a portion of the top portion of the sleeve, said widened bore portion defining an end face, facing the suction chamber, and a pressure shoulder recessed relative to the end face, said pressure shoulder serving to transmit the clamping force to the sleeve.

4,286,932

DIAPHRAGM PUMP

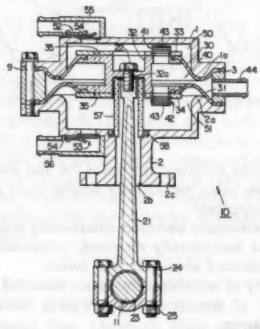
Shojiro Nagano; Naohiro Naganuma, both of Kariya, and Mikiji Ito, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 6, 1979, Ser. No. 9,803

Claims priority, application Japan, Feb. 14, 1978, 53-17824[U]; Mar. 13, 1978, 53-31914[U]; Apr. 20, 1978, 53-53052[U]; Jun. 6, 1978, 53-68075

Int. Cl.³ F04B *21/04*

U.S. Cl. 417—526 **20 Claims**



1. A diaphragm pump comprising:

a pair of generally annular diaphragms;

center disk means having the inner marginal portions of said diaphragms secured thereto and maintaining said diaphragms in spaced relation;

housing means enclosing said diaphragms and disk means and having the outer marginal portions of said diaphragms secured thereto, said housing means defining, with said diaphragms and said disk means, a pair of pumping chambers on opposite sides of said disk means for alternately receiving fluid from outside said housing means through housing means intake port means and alternately compressing the fluid and discharging it to outside said housing means through housing means discharge port means;

suction valve means and discharge valve means for each of said chambers;

connecting rod means extending into said housing means and having one end thereof attached to said disk means and the other end thereof adapted to be attached to rotating drive means for reciprocating said disk means and said diaphragms substantially axially thereof; and

bellows means surrounding a portion of said connecting rod means and having one end thereof sealed to said disk means and the other end thereof to said housing means and defining a part of the wall of one of said pumping chambers.

4,286,933

ROTARY VANE PUMP WITH PAIRS OF END INLET OR OUTLET PORTS

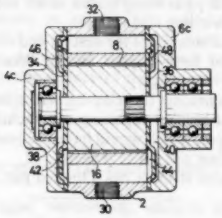
Hiroshi Sakamaki, Utsunomiya; Toshiyuki Maeda, Agoe; Fumihiro Ushijima, and Tadashi Saitou, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 5, 1979, Ser. No. 45,813

Claims priority, application Japan, Jun. 9, 1978, 53/69491

Int. Cl.³ F04C *27/00, 29/00*

U.S. Cl. 418—15 **6 Claims**



1. In a rotary fluid pump, including a housing body, a pair of recessed end heads assembled to opposite ends of the housing; a pair of resilient sealing plates individually disposed between the side of the housing and the recessed end heads to provide a rotor chamber between the sealing plates and a pair of end chambers each defined between the sealing plate and the recessed end head; a rotor supported in the rotor chamber; and a plurality of vanes slidably disposed in vane grooves formed in the rotor, the improvement comprising; fluid inlet and outlet ports adapted to communicate with the rotor chamber, at least one of said fluid inlet port or said outlet port formed symmetrically in each of the resilient sealing plates, to provide a pair of ports, wherein fluid communication between said ports and said end chambers being prevented and, a fluid inlet hole and a fluid outlet hole arranged in said housing body at a position corresponding to the longitudinal center of said rotor.

4,286,934

PRECAST HOUSE MANUFACTURING AND ERECTING PLANT

Mikhail Linetsky, #94-276 Adsum Dr., Winnipeg, Manitoba, Canada (R2P 0W2)

Filed Jan. 14, 1980, Ser. No. 111,933

Int. Cl.³ B28B *1/00*

U.S. Cl. 425—62 **5 Claims**

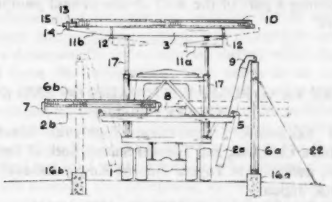
1. A portable plant for on-site horizontal casting and erecting concrete wall panels and roof slabs of bays with variable widths and heights reaching two storeies to form different types of houses and other buildings, said plant comprising:

a wheeled frame, supporting the casting and erecting equipment;

two rotatable and symmetrically set form-erectors for cast-

ing and erecting longitudinal bearing wall panels, said form-erectors being divided by hinges of rotating into two parts, one of which functions during erection as a jib, and the other part being a counterpoise, said form-erectors having the width in the cross direction less than the height of said wall panels and the top in a vertical position lower than the top of said wall panels being erected;

two motionless brackets holding said wall panels during erection, said brackets replacing a detachable edge on each form-erector, which would have become the top edge after rotating;



a lifting form for casting and erecting roof slabs with a flat bottom surface, said form having a hinged part on both longitudinal sides for producing said slabs with extended widths, said parts being folded down before erecting said slab and stripping said form;

a rotatable form-stripper for casting and erecting cross wall panels, said form-stripper having detachable side parts with a movable edge;

a hinged lock bracket for releasing said cross wall panel after fixing, said bracket replacing a detachable edge on said form-stripper, which would have become the bottom edge after rotating; the improvement:

wherein said form-stripper has a hinged part on both sides.

4,286,935

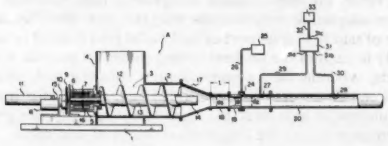
EARTH AND SAND CONVEYOR SYSTEM

Noboru Okuno, Hiratsuka; Takashi Takeuchi, Oiso; Akihiko Tsuzuku, Hiratsuka; Masao Tanazawa, Tokyo; Minoru Nakajima, Isehara, and Haruo Imamura, Fujisawa, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Nov. 8, 1979, Ser. No. 92,482

Int. Cl.³ B65G *53/04*

U.S. Cl. 425—72 R **3 Claims**



1. In an earth and sand conveyor system including a hopper adapted to receive dumped earth and sand, trough means connected to said hopper, a tapered pipe connected to said trough means, screw conveyor means rotatably mounted within said hopper and said trough means, and drive means for rotating said screw conveyor means, the improvement comprising:

consolidating pipe means for consolidating the earth and sand supplied from said tapered pipe, said consolidating pipe means having an inner diameter d_3 and being connected to said tapered pipe;

molding pipe means for molding the earth and sand supplied from said consolidating pipe means into a predetermined shape while passing therethrough, said molding pipe means having a molding pipe section with an inner diameter d_1 and a lubricating pipe section with an inner diameter d_2 and being connected to said consolidating pipe means;

conveyor pipe means connected to said molding pipe means and adapted for conveying the earth and said therethrough, said conveyor pipe means having the inner diameter d_2 wherein the d_1, d_2, and d_3 are set by a formula $d_1 < d_2 \leqq d_3$;

a plurality of first nozzle means for injecting a lubricant to lubricate the molded earth and sand formed circumferrentially in the wall of the lubricating pipe section immediately adjacent to the molding pipe section;

pump means for supplying a lubricant to said first nozzle means;

second nozzle means formed in the wall of the lubricating pipe section of said molding pipe means for injecting compressed fluid into said molding pipe means to cut the molded earth and sand and form a molded earth and sand plug therefrom, said second nozzle means being downstream of said plurality of said first nozzle means;

third nozzle means formed in the wall of said conveyor pipe means and spaced from said second nozzle means for injecting a compressed fluid into said conveyor pipe means to push the molded earth and sand on the cut surface thereof, thereby moving said molded earth and sand plug through said conveyor pipe means;

compressor means connected to said second and third nozzle means for supplying the compressed fluid thereto; and

directional control valve means disposed between said compressor means and said second and third nozzle means for alternately supplying the compressed fluid to said second and third nozzle means.

4,286,936

INJECTION CASTING APPARATUS FOR SHOE SOLES

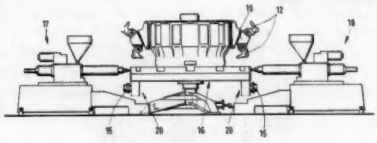
Hans Hustedt, Verden, Fed. Rep. of Germany, assignor to Desma-Werke GmbH, Achim bei Bremen, Fed. Rep. of Germany

Filed Feb. 27, 1980, Ser. No. 125,055

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1979, 2907751

Int. Cl.³ B29D *9/00*; B29C *1/16*; B29H *7/08*

U.S. Cl. 425—119 **5 Claims**



1. An injection molding apparatus for the manufacture of multi-layer shoe soles, particularly double layer polyurethane shoe soles, comprising:

(a) a first horizontally disposed, rotationally indexable turret,

(b) a second horizontally disposed, rotationally indexable turret positioned above the first turret,

(c) a plurality of selectable shoe lasts mounted on the outer periphery of the second turret in a circumferentially spaced manner,

(d) a plurality of mold assemblies mounted on the outer periphery of the first turret in a circumferentially spaced manner and individually cooperable with the shoe lasts,

(e) at least one sole material injection device fixedly mounted proximate the outer periphery of the first turret and selectively cooperable with an adjacent mold assembly,

(f) each mold assembly including a separable side mold adapted to be closed at its top by a shoe last,

(g) a plurality of rotatable heads individually mounted beneath the mold assemblies and having respective axes of rotation upwardly and outwardly inclined relative to the axis of the first turret,

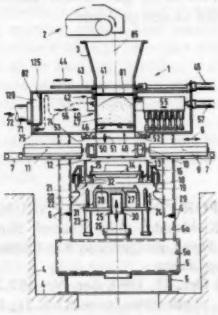
(h) a pair of support arms extending outwardly from each rotatable head and having intersecting longitudinal axes bisected by the rotatable head axis,
(i) a pair of alternately selectable sole molds individually mounted on the outer ends of the support arms,
(j) pressure cylinder means for raising and lowering each rotatable head to close the bottom of a mold assembly with a selected one of said sole molds and to disengage it therefrom, said pressure cylinder means operating along a vertical axis common to the selected sole mold and its associated support arm to prevent the occurrence of torque moments in the closed mold assembly, and
(k) the support arm of each non-selected sole mold extending radially outwardly from the first turret and each non-selected sole mold havine a generally upright longitudinal axis.

4,286,937

PRODUCTION OF SAND MOULDS

Walter Ahrens, Alfeld, Fed. Rep. of Germany, assignor to Alfelder Maschinen- und Modell-Fabrik Kunkel, Wagner & Co. KG, Fed. Rep. of Germany

Filed Oct. 1, 1979, Ser. No. 80,171
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1978, 2842912
Int. Cl.³ B28B *13/02*
U.S. Cl. 425—125 **9 Claims**



1. An apparatus for producing a mould, comprising means for putting a moulding compound in a buffer zone, means for reducing the pressure in the buffer zone and in a charging chamber over a pattern below atmospheric pressure, and means for transferring the moulding compound from the buffer zone into the charging chamber under gravity while maintaining the vacuum or partial vacuum produced on reducing pressure in the buffer zone and charging chamber below atmospheric pressure.

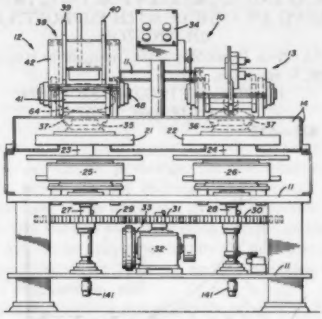
4,286,938

OVAL DISH FORMER

George Ryckman, East Liverpool, Ohio, assignor to Service (Engineers) Limited, Stoke-on-Trent, England

Filed Apr. 12, 1979, Ser. No. 29,288
Int. Cl.³ B28B *1/02*
U.S. Cl. 425—265 **15 Claims**

1. An oval dish forming machine for shaping clay on molds, said machine comprising a pair of spaced rotatable mold supports, means for rotating said mold supports and simultaneously imparting eccentric motion thereto, a pair of spaced work heads pivotally supported on said machine with their free ends movable toward and away from said mold supports in arcuate patterns, a roller shaping tool and means on one of said work heads mounting said roller shaping tool for rotary motion, said means being movable in a rocking action and means for imparting rotary movement to said roller shaping tool, means for imparting rocking motion to said means mounting said roller shaping tool, a second roller shaping tool and means on the other one of said work heads rotatably mounting said second roller shaping tool, means for imparting motion to said work heads arranged to move said work heads on said arcuate patterns, the axis of rotation of the roller shaping tools



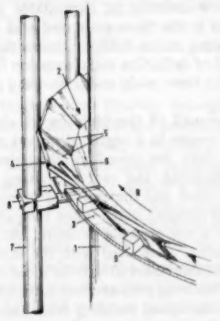
being inclined to the vertical with the inclination of the first roller shaping tool being less than that of the second roller shaping tool whereby in use the first roller shaping tool is operative primarily to spread said clay over said rotatable mold support and the second roller shaping tool is operative primarily to finish the surface of the clay spread by the first roller shaping tool.

4,286,939

DOUGH ROUNDER WITH ADJUSTABLE ROUNDING BOWLS

Johan Benier, Vught, Netherlands, assignor to Benier B.V., Ketelaarskampweg, Netherlands

Filed Jul. 10, 1980, Ser. No. 168,391
Claims priority, application Netherlands, Jul. 16, 1979, 7905535
Int. Cl.³ B29B *1/02, 1/04*
U.S. Cl. 425—333 **4 Claims**



1. A dough rounding machine provided with a rounding drum which is rotatable about a substantially vertically oriented axis and furthermore being provided with a trough extending helically or spirally about the drum, said trough consisting of a bottom and a bowl spaced apart from the drum, said bottom comprising plate sections successive in helical direction, abutting the drum and attached to a frame surrounding the drum, while the bowl consists of bowl sections likewise successive in helical direction and fixable on the bottom plate sections with variable distance to the drum, characterized in that each bottom plate section is flat and each bowl section is

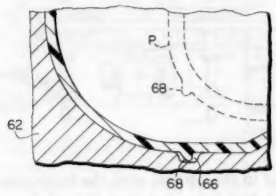
designed as a wall plate which, with a bottom edge completely abutting the bottom plate section, is movable over the bottom plate section towards and away from the drum with maintenance of said abutment.

4,286,940

METHOD AND APPARATUS FOR INJECTION BLOW MOLDING AN ARTICLE WITH IMPROVED DETAIL DEFINITION

Aime J. Gendron, Rehoboth, Mass., assignor to Hercules Incorporated, Wilmington, Del.

Filed May 21, 1979, Ser. No. 40,891
Int. Cl.³ B29C *17/07*
U.S. Cl. 425—533 **10 Claims**



1. Apparatus for forming molded articles with improved raised detail definition comprising:

a parison pin;

a blow mold having an interior mold wall defining a cavity for blowing a parison on the parison pin and also defining the general exterior shape of an article formed by expanding the parison in the cavity at a blowing pressure;

fluid pressure generating means cooperating with the parison pin and the blow mold for expanding the parison outwardly away from the pin and against the wall in the blow mold at the blowing pressure;

an injection mold associated with the parison pin and blow mold, and having an interior mold wall defining a mold cavity in which the pin is inserted and in which a settable material is injected between the pin and the mold wall to form a parison for subsequent transfer to and expansion in the blow mold, the injection mold wall including at least one region defining an expandable part of the parison expanded in the blow mold and said region of the mold wall bearing recess defining means defining raised molding detail of definition and dimension finer than that formable in the blow mold under blowing pressure and conditions;

the interior wall of the blow mold also including recess defining means in a region disposed in confronting relationship with the raised molding detail of the parison during blowing, the recess defining means defining a recess located and dimensioned to receive and preserve the raised molding detail when the parison is expanded in the mold at the blowing pressure; and

injection means connected with the injection mold for injecting settable material into the mold at a pressure greater than the blowing pressure and sufficient to form the parison with the raised molding detail thereon.

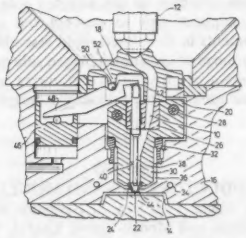
4,286,941

INJECTION MOLDING NOZZLE SEAL

Jobst U. Gellert, 7A Prince St., Glen Williams, Ontario, Canada

Filed Jul. 28, 1980, Ser. No. 173,084
Claims priority, application Canada, Jul. 15, 1980, 356233
Int. Cl.³ B29F *1/03, 1/05*
U.S. Cl. 425—566 **3 Claims**

1. In a valve-gated injection molding system comprising a heated heater cast seated in a cooled cavity plate, the heater cast having a nozzle portion which is separated from the cavity plate by an air space, a gate through the cavity plate leading to a cavity, a melt passage extending through the heater cast for conveying pressurized melt from a molding machine to the gate, an elongated valve pin to reciprocate in a bore in the heater cast between open and closed positions, the valve pin having a driven end and a tip end, and valve pin actuating mechanism, the improvement wherein a hollow nozzle seal having a central bore extends across the air space between the



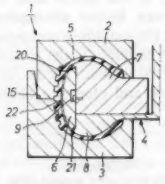
heater cast and the cavity plate with its bore coaxial with the bore of the heater cast and the gate, the nozzle seal having a first end portion received in the nozzle portion of the heater cast and a second end portion which extends into a gate aperture through the cavity plate, whereby the second end portion of the nozzle seal forms the gate which receives the tip end of the valve pin in the closed position.

4,286,942

APPARATUS FOR PRODUCING PNEUMATIC TIRES

Keizi Fuzioka, Kishiwada, and Masami Shinomiya, Izumi-Ohtsu, both of Japan, assignors to The Ohtsu Tire & Rubber Co., Ltd., Osaka, Japan

Filed Oct. 15, 1980, Ser. No. 197,231
Claims priority, application Japan, Oct. 31, 1979, 54-141696
Int. Cl.³ B29H *3/08, 5/06;* B29F *1/00;* B29H *5/18*
U.S. Cl. 425—577 **7 Claims**

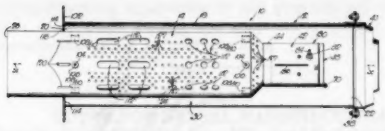


1. An apparatus for producing pneumatic tires comprising at least three fittable mold components of an upper mold element, a lower mold element and a core mold element for defining a cavity having the shape of the tires, and means for feeding rubber or an equivalently elastic molding material to the cavity in an amount sufficient to fill the cavity, the core mold element comprising at least three divided fittable mold segments for forming the inner surfaces of the tire tread and tire sidewalls including a pair of beads, the tread inner surface forming mold segment and at least one of the sidewall inner surface forming mold segments having on their opposed faces nipping portions movable toward or away from each other for holding at least one end of each of tire cords.

4,286,943
AIR HEATER

Joseph J. Petlak, 3 Lincoln Dr., Wallingford, Conn. 06492, and Joseph M. Salafia, Middletown, Conn., assignors to Joseph J. Petlak, Wallingford, Conn.

Filed Aug. 21, 1979, Ser. No. 68,417
Int. Cl.³ F23D *15/02*
U.S. Cl. 431—352 **1 Claim**

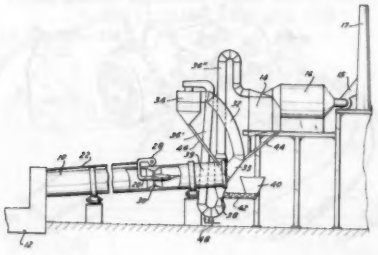


1. An air heater, providing two tubular bodies with a common axis, each having a cylindrical wall and open front and rear ends, of which one body extends in the other body and projects from the front end of the latter and said one body has its rear end formed as a compartment with an opening to said rear end of said other body, with the cylindrical wall of said one body being spaced inwardly from that of said other body to form a manifold therebetween, an oil burner located in said compartment, ports in said cylindrical wall of said one body distributed over the expanse of said manifold, an air blower having its output side connected with the open rear end of said other body to direct an air stream into said manifold, an adjustable shutter mechanism in said opening of said compartment for diverting combustion air from said stream into said compartment, a ring member closing said manifold at said open front end of said other body and provided with a multitude of apertures spaced about said ring member, a substantially continuous gap form between said ring member and the wall of said one body, with the velocity of said air stream being sufficiently high for keeping said manifold under permissible temperature control on setting the burner flame for maximum heat output and maximum spread substantially throughout the interior of said one body.

4,286,944
INSTALLATIONS FOR THE CALCINATION OF ALUMINA AND SIMILAR PRODUCTS

Gilbert Labriot, Marseilles; Robert Bitsch, Aix en Provence; Michel Wattelle, Les Lilas, and Jean Lebesgue, Avon, all of France, assignors to Aluminium Pechiney and Fives-Cail Babcock, both of Paris, France

Filed Nov. 14, 1979, Ser. No. 94,070
Claims priority, application France, Nov. 27, 1978, 78 33390
Int. Cl.³ F27B *15/00, 7/36, 7/02*
U.S. Cl. 432—14 **9 Claims**



1. The method of improving the thermal efficiency of a calcining installation comprising a long rotary kiln having an inlet for raw material to be calcined at an upstream end thereof and an outlet for the calcined material at a downstream end thereof, a burner generating heat in the kiln for calcining the raw material, an air inlet at the downstream end, a flue gas outlet at the upstream end, and a cyclone separator means for separating dust from the flue gas exhausted through the flue gas outlet, the cyclone separator means having an inlet connected to the flue gas outlet and a dust outlet, which comprises the steps of

(a) cycling the raw material through an additional cyclone separator having an inlet for the raw material, a gas outlet and an outlet for the raw material, and from the raw material outlet into the upstream end of the kiln,

(1) the raw material inlet of the additional cyclone separator being connected to the upstream end of the kiln and the gas outlet of the additional cyclone separator being connected to the inlet of the cyclone separator means through a pipe having a vertical portion,

(b) introducing the raw material in a lower part of the vertical pipe portion for preheating the raw material by the flue gas before the raw material passes through the raw material inlet of the additional cyclone separator,

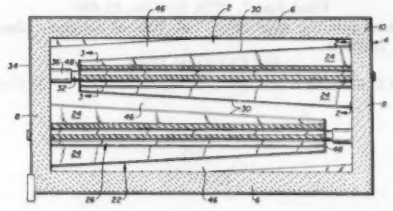
(c) subjecting the raw material cycled into the upstream end of the kiln to the heat generated by the burner in a half of the kiln adjacent the upstream end for calcining the preheated raw material, and

(d) cooling the calcined material in the other half of the kiln adjacent the downstream end thereof.

4,286,945
WALL FIRED DUCT HEATER

Ralph R. Vosper, San Jose, Calif.; Arie W. Spoormaker, Maassluis, Netherlands; Chester S. Binasik, Palo Alto, and Norman E. Harthun, San Carlos, both of Calif., assignors to Coen Company, Inc., Burlingame, Calif.

Filed Sep. 7, 1979, Ser. No. 73,348
Int. Cl.³ F24H *1/00*
U.S. Cl. 432—29 **47 Claims**



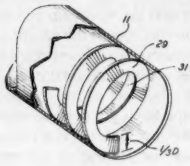
1. Apparatus for heating a gas flowing through a duct defined by opposing duct walls which are generally parallel to the gas flow direction, the apparatus comprising: at least one burner means for producing an elongate, pencil-shaped flame having a diameter near the burner which is larger than the diameter remote from the burner, said burner means including means for mounting the burner means to the wall so that the burner means forms a flame extending into the duct transversely to the gas flow direction; and a means for shielding the flame including means for mounting the shield means to a wall of the duct so that the shield means is positioned upstream of the flame and extends generally parallel to the flame into the duct, the shield having a lateral extent in a direction transverse to the gas flow which is relatively large at a base of the shield proximate the burner and which is relatively small adjacent an end of the shield remote from the burner so that the shield defines a trough protecting the flame from the gas flow through the duct which has a shape approximating the shape of the flame, the shield means having a passage therethrough for directing combustion sustaining oxygen to the flame, said passage being disposed axially along the shield means so that the gas flow impinges along substantially the entire length of the flame.

4,286,946

CALCINER REVERSE FEED DISCHARGE SPIRAL

James N. Christini, Towanda, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Apr. 24, 1980, Ser. No. 143,234
Int. Cl.[3] F27B 6/08; F27D 3/00
U.S. Cl. 432—112 11 Claims



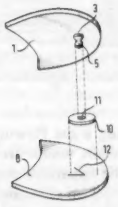
1. A reverse feed spiral for a refractory metal reclaiming calciner having a cylindrical rotatable retort of a given inner diameter with a material-receiving end and a material discharging end separated by a hot zone and coupled to a motor drive source for effecting rotation of said rotatable retort in a given direction to provide material flow in a given direction, said reverse feed spiral characterized by the improvement wherein a spiral having a reverse pitch with respect to said given direction of rotation and of material flow within said rotatable retort is positionally located within said material-discharging end of said rotatable retort whereby the direction of material flow within said material-discharge end of said rotatable retort is reversed by said reverse feed spiral and retention time of said material within said rotatable retort is increased.

4,286,947

INTRA-ORAL ALIGNING ASSEMBLY

Karl Daiberl, Untersbergstrasse 4/II r., 8000 Münich 90, Fed. Rep. of Germany

Filed Jun. 7, 1979, Ser. No. 46,498
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1978, 2825470
Int. Cl.[3] A61C 19/04
U.S. Cl. 433—72 33 Claims



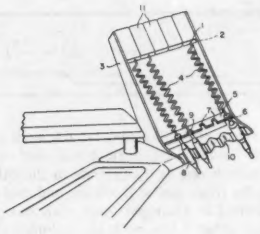
1. An adjusting assembly for use in prosthodontics, occlusion diagnosis and/or occlusion therapy, comprising an upper jaw plate; a lower jaw plate, one of said plates being provided with an opening; and a pin having an externally threaded shaft partly received in one of the plates and having a free end adapted to be partly received in said opening, said free end being configurated as a spherical segment rigid with said shaft and having a spherical surface, said spherical surface being curved rearwardly from a point located on the longitudinal axis of the shaft through at least 100° of arc, said opening having a diameter being smaller than that of said spherical segment, the diameter and length of said opening as well as the diameter of said segment being so coordinated with one another that even at the largest degree of relative skewing to be expected of said bite plates a circumferential edge of said opening will abut said spherical surface along the entire length of said circumferential edge substantially without any freedom of play.

4,286,948

DENTAL TREATMENT APPARATUS

Helmut Pietschmann, Karlsbad, Fed. Rep. of Germany, assignor to Sybron Corporation, Rochester, N.Y.

PCT No. PCT/DE78/00027, § 371 Date Jun. 15, 1979, § 102(e) Jun. 11, 1979.
This PCT application filed Oct. 16, 1978, Ser. No. 140,772
Int. Cl.[3] A61C 1/14
U.S. Cl. 433—77 3 Claims



1. In a dental treatment apparatus including a plurality of dental instruments of the type requiring a utility supply for each instrument, spirally coiled supply lines connecting each of the instruments to a utility supply, and an instrument mount, the improvement comprising:

(a) said utility supply being spaced above said mount and in a substantially straight vertical line from said mount;

(b) each of said utility supply lines being spirally coiled for substantially its full length from one end which is connected to said utility supply, to its other end which is connected to said instrument, each of said supply lines being freely suspended from said utility source to said instrument in a substantially straight vertical line; and

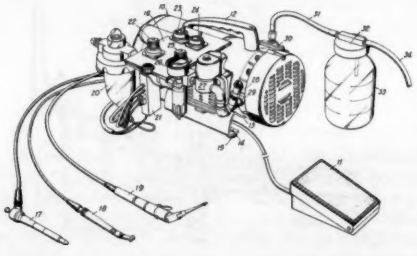
(c) means adjacent the rear end of each instrument and cooperating with said mount for releasably holding said instruments substantially vertically suspended with the front of said instruments pointing downward.

4,286,949

PORTABLE DENTAL APPARATUS

Raleigh A. Holt, Jr., 122 Pinehill Rd. NW., Orangeburg, S.C. 29115

Filed Feb. 15, 1980, Ser. No. 121,823
Int. Cl.[3] B05B 9/04
U.S. Cl. 433—103 2 Claims



1. A portable dental treatment apparatus comprising a unitized body portion in the form of a horizontal axis motor-compressor unit, a carrying handle fixed on the top of said unit, a supporting base for the apparatus fixed on the bottom of said unit including wide stance feet adjacent to the opposite sides of said unit for the support of the apparatus on a horizontal sup-

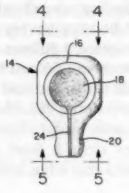
port surface, a treatment component support and control panel fixed on said unit near the top of the unit in a horizontal plane spaced above and parallel to a plane in which said feet are located, a plurality of conventional dental treatment components bodily mounted on and supported by said panel and being operatively connected with the compressor of said motor-compressor unit, said panel and said treatment components on the panel being disposed adjacent to one side of said unit in cantilevered relationship to the unit, and a vacuum cylinder unit fixed on the other side of said motor-compressor unit in counterbalancing relationship to said platform and the treatment components thereon and adapted for connection to a conventional dental vacuum assembly.

4,286,950

COVER FOR DENTAL HANDPIECE BUR

Gene R. Hawk, 139 Fair Ave., NE., New Philadelphia, Ohio 44663

Filed Mar. 24, 1980, Ser. No. 133,012
Int. Cl.³ A61C *1/16*
U.S. Cl. 433—116 **4 Claims**



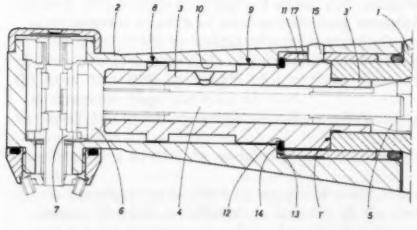
1. A cover for a dental handpiece end and a bur or other tool positioned thereon, which bur extends substantially at a right angle to the longitudinal axis of the handpiece, comprising a tubular boot-like structure of generally L-shape, having an enlarged leg portion with an open end adapted to engage the end of a dental handpiece and an open ended smaller diameter foot portion adapted to encompass the handpiece end and a dental drill or bur positioned thereon, said structure being split on a line extending continuously from the foot portion open end to the enlarged leg open end on the inner surface of the L-shaped structure said structure having some resilience and flexibility to enable it to be sprung into and out of engagement with the handpiece end and tool thereon.

4,286,951

DENTAL HANDPIECE

Henri Leonard, Besancon, France, assignor to Micro Mega, S.A., France

Filed Nov. 29, 1979, Ser. No. 98,617
Claims priority, application France, Dec. 27, 1978, 78 37117
Int. Cl.³ A61C *1/08, 1/12, 1/05*
U.S. Cl. 433—126 **5 Claims**



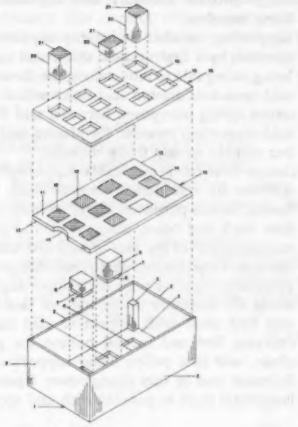
1. A dental handpiece comprising a rear portion or handle and a front portion or head, means comprising a bayonet joint for coupling said handle and head together end-to-end, an internal support fitting freely in said head and having a rear portion extending freely into said handle, a tool-driving shaft rotatably supported in said internal support, said internal support having in the vicinity of the junction between said head and handle an enlargement defining a forwardly facing shoulder and a rearwardly facing shoulder, and an annular groove at the base of said forwardly facing shoulder, an O-ring received in said groove and against said forwardly facing shoulder, said handle having an internal shoulder engageable with said rearwardly facing shoulder of said enlargement, and said head having an internal shoulder engageable with said O-ring, said enlargement and O-ring being clamped between said internal shoulders of said handle and head when said handle and head are coupled by said bayonet joint to position said internal support longitudinally in said head and handle and to restrain it against rotation.

4,286,952

EDUCATIONAL TOY

Mary E. Roche, R.R. #1, Box 435A, Markelville, Ind. 46056

Filed Jan. 2, 1980, Ser. No. 108,977
Int. Cl.³ G09B *1/06*
U.S. Cl. 434—259 **4 Claims**



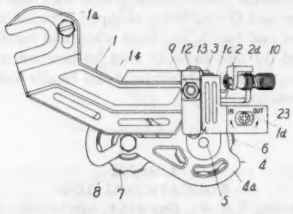
1. An educational toy comprising an open top box having a bottom adapted to receive a plurality of platform blocks removably inserted therein, said box being provided with support means mounted therein which support means are adapted to support a color board and a grate, a plurality of platform blocks adapted to be removably inserted into the said bottom of the said box and adapted to receive a plurality of game blocks removably placed thereon, a plurality of game blocks wherein a portion of each block is provided with a distinctively colored figure corresponding in color to a color of a figure on a surface of a color board, the said game blocks being adapted to be slidably inserted through a plurality of openings in a grate and adapted to be removably placed on the aforesaid plurality of platform blocks and on a surface of a color board, a color board adapted to be removably inserted into the aforesaid top of the aforesaid box and to sit on the aforesaid support means and to receive a grate and the aforesaid plurality of game blocks removably placed thereon, and a grate having a plurality of openings therethrough and adapted to be removably inserted into the aforesaid top of the aforesaid box and to sit on the aforesaid support means and to sit on a color board, wherein the said plurality of openings in the said grate is adapted to receive a plurality of game blocks slidably inserted therethrough.

4,286,953

BICYCLE DERAILLEUR HAVING AN IMPROVED MECHANISM FOR SWINGING A CHAIN GUIDE

Keizo Shimano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Apr. 21, 1980, Ser. No. 142,378
Claims priority, application Japan, May 4, 1979, 54-59800[U]
Int. Cl.³ F16H 11/08
U.S. Cl. 474—80 7 Claims



1. A bicycle derailleur for shifting a driving chain to a selected one of a plurality of axially aligned sprockets forming a multistage sprocket assembly, said derailleur comprising:

a fixing member;

a supporting member swingably supported to said fixing member by a first vertical shaft, said supporting member being swingable to move along the direction of the axes of said sprockets around said first vertical shaft;

a return spring interposed between said fixing member and said supporting member for biasing said supporting member relative to said fixing member;

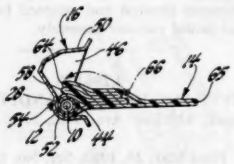
a change-over frame swingably supported to said supporting member by a second horizontal shaft, said second shaft having its axis perpendicularly intersecting the axis of said first shaft and being disposed at the position where an extension line of the axis of said first shaft passes through the axis of said second shaft, said change-over frame being swingable together with said supporting member to move along the direction of the axes of said sprockets around said first shaft with respect to said fixing member and carrying first and second pulleys for guiding a driving chain, said first pulley being supported rotatably to the foremost end of said change-over frame through a third horizontal shaft in parallel with said second shaft.

4,286,954

METHOD OF FOLDING AN INFLATABLE RESTRAINT CUSHION

Donald N. McArthur, Clarkston, and Robert A. Heintz, Northville, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 3, 1979, Ser. No. 99,886
Int. Cl.³ B60R 21/06
U.S. Cl. 493—244 2 Claims



1. A method of folding an inflatable restraint cushion for storage in a support housing having a cavity in which a gas generator is located within a diffuser and is fixedly secured in said cavity, said cavity being defined by an upper wall, a lower wall and a pair of side walls, and said inflatable restraint cushion including two overlying flat sheets of flexible material arranged to form a top sheet and a bottom sheet with the sheets being joined together along a front edge, a pair of laterally spaced side edges and a rear edge, said method comprising the steps of:

(a) mounting said front edge of said sheets to said diffuser;

(b) placing said rear edge of said sheets along an imaginary line which is parallel to said front edge and spaced from the latter a distance which causes said top and bottom sheets to be taut;

(c) successively moving a portion of said top sheet towards said diffuser so as to form a series of overlying pleated sections which are progressively shorter in length until the overall fore and aft dimension of said cushion approximates the distance between said top and bottom walls of said cavity;

(d) and rotating said cushion as a unit into said cavity for storing said cushion until the latter is inflated by said gas generator.

4,286,955

FIBER SHRINKING COMPOSITION FOR NYLON PILE FABRIC

Robert D. Lewis, Landisville, Pa., assignor to Armstrong Cork Company, Pa.

Filed Jul. 30, 1979, Ser. No. 62,317
Int. Cl.[3] D06P *3/24;* B05D *5/00*
U.S. Cl. 8—115.6 9 Claims

1. An aqueous-based nylon fiber shrinking composition comprising in weight percent from about 5 to about 50 percent calcium nitrate; from about 5 to about 20 percent benzyl alcohol; from about 2.5 to about 15 percent of a polyhydric alcohol or any oxy derivative of a polyhydric alcohol; from about 1 to about 10 percent of a urea compound selected from the group consisting of urea, thiourea, and 1,3-dimethylurea and at least one carboxylic acid selected from the group consisting of formic, acetic, propionic, butyric, oxalic, malonic, glutaric, maleic, glycolic, lactic, glyceric, malic, tartaric and citric; said carboxylic acid being employed in a total amount of from about 5 to about 45 percent.

4,286,956

FLUID, COLD-STABLE, TWO-COMPONENT WASHING COMPOSITIONS

Wolfgang Bechstedt, Düsseldorf-Garath, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Oct. 19, 1979, Ser. No. 86,479
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1978, 2847437
Int. Cl.[3] C11D *9/30, 10/04, 10/06, 17/08*
U.S. Cl. 8—137 14 Claims

1. A method of washing soiled textiles consisting of the steps of adding a washing agent consisting of two components, A and B wherein component A is an aqueous dispersion of fatty acids consisting essentially of

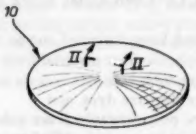
(a) from 25% to 35% by weight of a C_{12-18} fatty acid having from 60% to 100% of the fatty acids of oleic acid,
(b) from 10% to 16% by weight of a potassium soap of said C_{12-18} fatty acid of (a),
(c) from 15% to 25% by weight of an ethoxylate of from 5 to 12 ethoxylate units onto a primary alcohol selected from the group consisting of linear C_{8-14}-alkanols and C_{8-14}-2-methylated-alkanols,
(d) from 4% to 10% by weight of a sodium C_{10-14}-alkylbenzenesulfonate,
(e) from 0.05% to 1% by weight of an alkali metal salt of substituted stilbenesulfonic acid optical brighteners,
(f) from 1% to 5% by weight of a hyrotrope selected from the group consisting of urea and alkali metal salts of alkylbenzenesulfonates having from 1 to 2 alkyl of groups with a total of 1 to 3 carbon atoms,
(g) from 2% to 10% by weight of alcohols selected from the group consisting of C_{1-3} alkanols and mixtures of C_{1-3} alkanols with up to 50% by weight of the mixture of C_{1-4}-alkoxy-C_{2-3}-alkanols or C_{1-4}-alkoxy-C_{2-3}-alkoxy-C_{2-3}-alkanols, and
(h) from 15% to 30% by weight of water; and component B is an aqueous solution of alkalies consisting essentially of
(i) from 0.5% to 5% by weight of sodium tripolyphosphate,
(j) from 0 to 25% by weight of potassium tripolyphosphate,
(k) from 0 to 10% by weight of a sodium silicate of the composition Na_2—:SiO_2 1:1 to 1:3.5,
(l) from 0.5% to 5% by weight of sodium ethylenediaminetetraacetate,
(m) from 10% to 25% by weight of potassium hydroxide, and
(n) the remainder up to 100% by weight of water, where the amount of water is sufficient to dissolve all the constituents at room temperature; where the ratio of component A to component B in the combination for washing is from 1:1 to 1:4 and where the washing solution has a pH of from 9.5 to 14, to an aqueous wash liquor containing soiled textiles in such amounts that the total amount of all active washing ingredients including wash alkalies is from 5 gm to 30 gm per kg of dry textiles, agitating said textiles in said wash liquor, draining and rinsing said textiles and recovering clean textiles.

4,286,957

PROCESS OF INTEGRATING A PHOTOCHROMIC SUBSTANCE INTO AN OPHTHALMIC LENS AND A PHOTOCHROMIC LENS OF ORGANIC MATERIAL

Lyliane Le Naour-Sene, Vincennes, France, assignor to Essilor International "Cie Generale d'Optique", Creteil, France

Filed Jan. 10, 1979, Ser. No. 2,303
Int. Cl.[3] D06P *5/00;* G03B *21/46*
U.S. Cl. 8—471 17 Claims



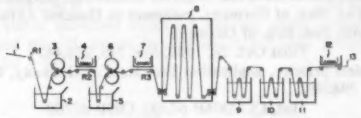
1. A process of integrating a photochromic substance into a transparent substrate of polymerized organic material comprising the steps of placing a photochromic material containing a photochromic substance into contact with the substrate, and heating the photochromic material thus in contact with the substrate thereby thermally transferring the photochromic substance into the substrate.

4,286,958

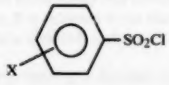
METHOD OF DYEING CELLULOSE FIBER-CONTAINING STRUCTURES

Takahiro Fujiu, Funabashi; Masao Nakajima, Tokyo, and Shigeru Okano, Musashino, all of Japan, assignors to Toppan Printing Co., Ltd., Japan

Filed Oct. 25, 1979, Ser. No. 87,923
Claims priority, application Japan, Nov. 1, 1978, 53/135086; Jan. 24, 1979, 54/7525; May 11, 1979, 54/47867; May 15, 1979, 54/59363; Jun. 15, 1979, 54/74269; Aug. 24, 1979, 54/107897
Int. Cl.[3] C09B *62/00*
U.S. Cl. 8—471 15 Claims



1. A method of dyeing a fiber structure composed of a cellulose fiber or a blend of cellulose fiber and a synthetic fiber which comprises the steps of impregnating the fiber structure with an alkaline compound in an amount of from 1 to 20% by weight based on the weight of the fiber structure and with a modifying agent, the molar ratio of the alkaline compound to the modifying agent being 0.1 to 2.0, and the modifying agent being a compound of the formula



where X is —H, —NO_2, —CH_3, or —SO_2Cl; effecting chemical modification of the impregnated fiber structure by heat-treating it under steaming conditions at a temperature of from about 100° to 180° C. or dry heating conditions at a temperature of from about 60° to 180° C. for a time period not exceeding 20 minutes; and then dyeing the modified fiber structure

with a dye selected from the group consisting of a disperse dye, an oil-soluble dye, a mordant dye, and a basic dye.

4,286,959

DISPERSE DYE FORMULATIONS

Dieter Horn, Heidelberg; Ewald Daubach, Ludwigshafen; Erwin Hahn, Heidelberg; Herbert Uhrig, Worms; Richard Hoene, Heidelberg, and Herbert Naarmann, Wattenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 8, 1979, Ser. No. 18,765

Int. Cl.³ C09B *67/00, 67/22, 67/38*

U.S. Cl. 8—524 **12 Claims**

1. A free-flowing formulation of one or more disperse dyes for dyeing hydrophobic fiber material from an aqueous liquor, which formulation comprises

(a) one or more disperse dyes, and

(b) one or more polymers which are soluble, or colloidally soluble, both in water at a pH of from 1 to 9 and in an organic solvent, said polymers being prepared by free radical or ionic polymerization or by a poly-Menschutkin reaction,

(a) being enclosed in a matrix of

(b) in the form of a solid solution in a state of molecular dispersion of extremely find subdivision so that in an X-ray diffraction pattern the dyes appear amorphous, said formulation having been prepared from a solution in said organic solvent which contains (a) and (b), with (a) being present in the solution in a state of molecular dispersion, by removing the solvent.

4,286,960

DYESTUFF COMPOSITIONS CONTAINING ACYLATED ALKOXYLATES OF POLYHYDRIC ALIPHATIC ALCOHOLS

Manfred Schneider, Eppstein; Hubert Kruse, Kelkheim; Konrad Opitz, Liederbach, and Siegfried Billenstein, Burgkirchen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

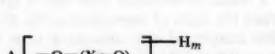
Filed Oct. 28, 1980, Ser. No. 201,443

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1979, 2943902

Int. Cl.³ D06P *67/00;* **C09B** *67/00*

U.S. Cl. 8—527 **13 Claims**

1. A composition of matter comprising a water-soluble ester of the formula



wherein A is the residue of an aliphatic or cycloaliphatic dihydric to hexahydric alcohol of 2 to 10 carbon atoms, the X's stand for the same or different groups of the formulae

$$-CH_2-CH_2-$$

and

$$-CH_2-CH(CH_3)-,$$

R—CO— is the acyl radical of a carboxylic acid having up to 22 carbon atoms, the n's stand for the numbers of 8 to 150, m is an integer of zero to 4, p is an integer of 2 to 6, with the proviso that p-m is at least 2, and a disperse or vat dyestuff.

4,286,961

REDUCTION CLEARING OF DISPERSE DYES

Rolf Buser, Muttenz, Switzerland; Francis Palacin, Riedisheim, France; Georg Robert, and Franz Somm, both of Riehen, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 873,132, Jan. 30, 1978, abandoned. This application Aug. 2, 1979, Ser. No. 63,054

Claims priority, application Switzerland, Feb. 4, 1977, 1388/77

Int. Cl.³ D06P *5/02, 3/872*

U.S. Cl. 8—532 **23 Claims**

1. A process for treating a synthetic/cellulosic fibre mixed tensile substrate which has been dyed or printed with at least one disperse and at least one reactive dye and which contains no resin protection for the fixed reactive dye comprising, after fixation, reductively treating the dyed or printed substrate at a neutral to alkaline pH with an aqueous solution containing a reducing agent selected from the group consisting of sodium formaldehyde sulphoxylate, sodium hydrogensulphide, sulphides, sulfites (SO_3^{--}), polysulphides, glucose, fructose, lactose and dextrine, the rH value of said solution being selected from a value of from 0 to 30, such as to decompose non-bound disperse dyestuff and render it colourless, decompose it such that it does not re build-up on the substrate, or both whilst leaving the fixed reactive dyestuff substantially unaffected.

4,286,962

PHTHALOCYANINE REACTIVE DYESTUFFS, THEIR PREPARATION AND THEIR USE FOR DYEING MATERIALS CONTAINING HYDROXYL GROUPS OR AMIDE GROUPS

Volker Ehrig, Berg.-Gladbach; Manfred Groll, Cologne, and Klaus Wunderlich, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

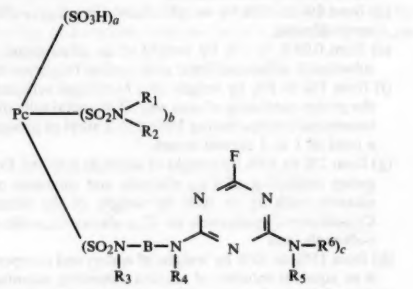
Filed Dec. 31, 1979, Ser. No. 108,312

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1979, 2901481

Int. Cl.³ C09B *62/10*

U.S. Cl. 8—549 **8 Claims**

1. Phthalocyanine reactive dyestuffs of the formula



wherein

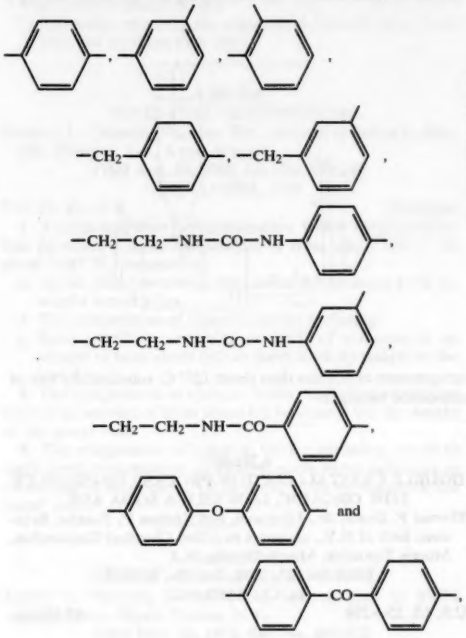
Pc the radical of a copper phthalocyanine or nickel phthalocyanine,

R_1 and R_2 H or optionally substituted alkyl, or R_1 and R_2, together with N, forming a 5-membered or 6-membered heterocyclic ring,

R_3 and R_4 H or optionally substituted alkyl,

R_5 and R_6 hydrogen, optionally substituted alkyl with 1 to 5 C atoms, optionally substituted cycloalkyl or aralkyl or an optionally substituted aryl radical which is free from sulphonic acid groups and carboxylic acid groups, or R_5 and R_6, together with N, a 5-membered or 6-membered heterocyclic ring,

B a bridge member selected from the group consisting of



a=1 to 3,
b=0 to 2,
c=1 or 2 and
a+b+c≦4.

2. Phthalocyanine reactive dyestuffs of the formula wherein

Pc the radical of a copper phthalocyanine or nickel phthalocyanine;
R_1, R_2, R_3 and R_4 hydrogen, methyl or ethyl,
R_5 and R_6 hydrogen, optionally substituted alkyl with 1 to 5 C atoms, optionally substituted cycloalkyl or aralkyl or an optionally substituted aryl radical which is free from sulphonic acid groups and carboxylic acid groups, or R_5 and R_6, together with N, a 5-membered or 6-membered heterocyclic ring,
B 1,2-phenylene, 1,3-phenylene or 1,4-phenylene optionally substituted by C_1–C_4-alkyl groups, C_1–C_4-alkoxy groups or halogen atoms,
a=1–3,
b=0–2,
c=1 and
a+b+c=2–4.

4,286,963

DIFFERENTIAL LYMPHOID-MYELOID DETERMINATION OF LEUKOCYTES IN WHOLE BLOOD

Stephen L. Ledis, Hialeah; David L. Chastain, Jr., Ft. Lauderdale, and Harold R. Crews, Miami, all of Fla., assignors to Coulter Electronics, Inc., Ill.

Filed Nov. 23, 1979, Ser. No. 96,697
Int. Cl.[3] G01N *33/48, 33/72*
U.S. Cl. 23—230 B **17 Claims**

1. A lytic diluent comprising a mixture of ingredients (A) and (B) where

(A) is an aqueous saline solution of at least one quaternary ammonium salt having surface active properties, and

(B) is at least one additive selected from the group consisting of

(1) a short chain alkanol substituted by phenyl or phenoxy; and

(2) a polyhydroxy compound;

said lytic diluent being buffered to an acid pH within the range of 3.5 to 5.0, and each of said ingredients (A) and (B) being present in an amount sufficient to bring about rapid and complete lysing of the red cells in whole blood for making a differential determination of lymphoid and myeloid populations of leukocytes, and also for measuring hemoglobin by chromagen formation.

10. A lytic diluent comprising a mixture of ingredients (A) and (B) where

(A) is an aqueous saline solution of at least one quaternary ammonium salt having surface active properties, and

(B) is at least one additive selected from the group consisting of

(1) a short chain alkanol substituted by phenyl or phenoxy; and

(2) a polyhydroxy compound;

said lytic diluent being buffered to an acid pH within the range of 3.5 to 5.0, and each of said ingredients (A) and (B) being present in an amount sufficient to bring about rapid, but incomplete, lysing of the red cells in whole blood for making a differential determination of lymphoid and myeloid populations of leukocytes, and also for measuring hemoglobin for chromagen formation, wherein said chromagen formation is completed by the addition of an alkaline reagent comprising an aqueous solution of a quaternary ammonium salt and an alkali metal cyanide, the mixture being buffered with a basic buffer in sufficient concentration to allow rapid neutralization of said lytic diluent which is buffered to an acid pH.

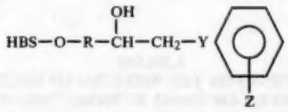
4,286,964

POLYFUNCTIONAL EPOXIDES AND HALOHYDRINS USED AS BRIDGING GROUPS TO BIND AROMATIC AMINE GROUP-CONTAINING ALCOHOLS AND THIOLS TO HYDROXYL BEARING SUBSTRATES

Brian S. Seed, 40 Graham Rd., Scarsdale, N.Y. 10583

Filed Oct. 12, 1979, Ser. No. 84,509
Int. Cl.[3] C08B *11/20, 15/06;* **G01N** *31/22, 33/16*
U.S. Cl. 23—230 B **33 Claims**

4. A stable modified hydroxyl bearing sheet comprising substituted phenyl groups having structural units having the general formula:



in which HBS comprises a hydroxyl bearing substrate, R is selected from the group consisting of alkyl groups, hydroxyl bearing groups, aryl groups, alkylaryl groups, alkyl ether groups, hydroxyl bearing alkyl ether groups, aryl ether groups, alkylaryl ether groups, and hydroxyl bearing alkylaryl ether groups; Y is selected from the group consisting of oxygen and sulfur; and in which Z is selected from the group consisting of primary amines, diazo chlorides, diazo fluoborates, and diazo fluorophosphates.

10. A process for preparing a derivative of a hydroxyl bearing substrate comprising the steps of:

reacting a hydroxyl bearing substrate with oxirane bearing molecules to produce an oxirane ring bearing substrate; and

reacting the oxirane ring bearing substrate with a substituted primary aromatic amine selected from the group consisting of primary aromatic amine alcohols and primary aromatic amine thiols.

4,286,965

CONTROL APPARATUS FOR AUTOMATICALLY MAINTAINING BATH COMPONENT CONCENTRATION IN AN ELECTROLESS COPPER PLATING BATH

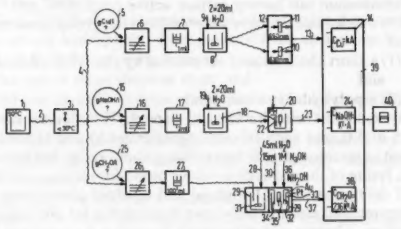
Jacky Vanhumbeeck, Brugge; Hubert De Steur, Drongen; Guido Heyneman, Knokke, and Chris Vandenbossche, Zwijnaarde, all of Belgium, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 28, 1980, Ser. No. 125,374

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1979, 2911073

Int. Cl.³ G01N *31/16*; B05D *3/12*

U.S. Cl. 23—230 A **13 Claims**



9. A method of automatically controlling the concentration of at least main components in an electroless copper plating bath having main components comprised of an aqueous solution of copper ions, an aqueous solution of sodium hydroxide and an aqueous solution of formaldehyde so that said concentration remains relatively constant throughout the operation of said bath, comprising the steps of:

discontinously withdrawing three separate samples from said bath, each sample being of a predetermined volume;

diluting each of said separate samples with a specific amount of water;

independently determining the concentration of each respective main component in a respective sample and generating a signal corresponding to such concentration; and

adding a fresh amount of each main component to said bath in accordance with said signal.

4,286,966

PROCESS FOR THE MELTING OF SULFUR

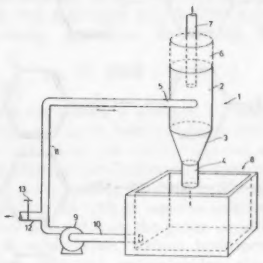
Charles R. Kirby, and Donald R. McKay, both of Rossland, Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed Apr. 11, 1980, Ser. No. 139,313

Int. Cl.³ B01J *8/00*

U.S. Cl. 23—293 S **15 Claims**

1. A method for separating moisture associated with sulfur at atmospheric pressure which comprises the steps of establishing a source of molten sulfur, said molten sulfur having a temperature of at least about 120° C., circulating molten sulfur at a temperature in the range of about 120° to 160° C. from said source through a mixing device and establishing in said mixing device a substantially spiral flow of circulating molten sulfur having a continuous vortex extending axially through the mixing device by feeding said circulating molten sulfur tangentially to said spiral flow, said spiral flow having a centrifugally accelerated velocity comprising a tangential component, increasing said tangential component of the velocity while maintaining the vortex, feeding sulfur having associated moisture in the range of 0 to 70% by weight into said vortex of circulating molten sulfur, discharging molten sulfur at a temperature of not less than 120° C. from said mixing device into the said source of molten sulfur and recovering molten sulfur having a



temperature of not less than about 120° C. substantially free of associated moisture.

4,286,967

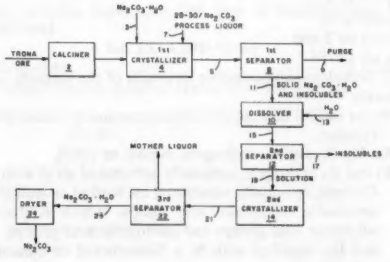
DOUBLE CRYSTALLIZATION PROCESS TO PRODUCE LOW ORGANIC, LOW SILICA SODA ASH

Elwood F. Booth, Jr., Liverpool, and Rustom P. Poncha, Syracuse, both of N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jun. 27, 1980, Ser. No. 163,848

Int. Cl.³ C30B *9/02*

U.S. Cl. 23—298 **17 Claims**



1. A process for the production of low organic, low silica, anhydrous sodium carbonate which comprises:

(a) calcining raw trona ore to produce a crude sodium carbonate containing soluble and insoluble impurities;

(b) admixing said crude sodium carbonate with a substantially saturated aqueous sodium carbonate solution to form sodium carbonate monohydrate crystals, insoluble impurities and a sodium carbonate solution containing soluble impurities;

(c) separating said sodium carbonate monohydrate crystals and insoluble impurities from said sodium carbonate solution;

(d) admixing said sodium carbonate monohydrate crystals and insoluble impurities with water in an amount sufficient to form a substantially saturated sodium carbonate solution and insoluble impurities.

(e) separating said solution from said insoluble impurities;

(f) evaporating said solution to form sodium carbonate monohydrate crystals;

(g) optionally, subjecting the crystals recovered in step (f) to steps (d–f) once, but no more than once;

(h) heating said sodium carbonate monohydrate crystals to obtain low organic, low silica, anhydrous sodium carbonate product particles; and

(i) optionally, repeating the sequence defined by steps (b-h) once, but no more than once.

4,286,968

SOLID FUEL COMPOSITION

Dominic L. Casinelli, Houston, Tex., assignor to James E. Harrell, Houston, Tex., a part interest

Filed Aug. 18, 1980, Ser. No. 179,118
Int. Cl.³ C10L *5/00*
U.S. Cl. 44—1 R **15 Claims**

1. A solid moldable fuel composition which upon combustion produces a flame temperature of from about 750° F. to about 3000° F., comprising:

an acetal resin containing from about 0.5 to about 1.5% by weight fumed silica.

3. The composition of claim **1**, further including:

a flame retardant containing an oxide of antimony in an amount of from about 0.05 to about 0.8% by weight of the acetal resin.

6. The composition of claim **3**, further including a cellulose ester in an amount of from about 0.1 to about 1.0% by weight of the acetal resin.

8. The composition of claim **6**, further including an alkali earth metal carbonate or an alkaline earth metal carbonate in an amount of from about 1.0 to about 3.0% by weight of the acetal resin.

4,286,969

HYDROCARBON FUEL ADDITIVE

Eugene C. Medcalf, Bound Brook, N.J., assignor to BWM Corporation, Mount Vernon, N.Y.

Filed Mar. 20, 1978, Ser. No. 890,552
Int. Cl.³ C10L *1/18*
U.S. Cl. 44—53 **9 Claims**

1. An additive for use with a hydrocarbon fuel which comprises a solution of a halogenated hydrocarbon containing from about 0.1 to about 10 percent by weight of a hydroperoxide and a compound selected from the group consisting of naphthylene, halogenated naphthylene and alkyl derivatives of naphthylene.

4,286,970

REACTOR WITH PARTICULATE RECYCLING FILTRATION MEANS

Nurettin T. Cankurt, and Anthony H. Furman, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 26, 1980, Ser. No. 134,068
Int. Cl.³ C10J *3/20*; C10K *1/02*
U.S. Cl. 48—87 **9 Claims**

1. In a reactor vessel for generating a product fluid, a particulate recycling filtration means comprising:

a port in said vessel for exhausting product fluid therefrom;

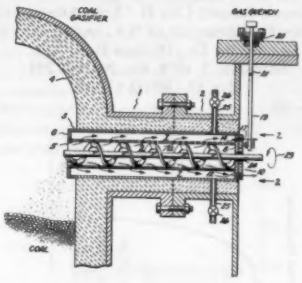
a tubular member positioned within at least a portion of said port in spaced relationship therewith;

a fluid-permeable portion of said tubular member which is substantially impermeable to particulates and which has an inboard and an outboard end;

a fluid barrier disposed intermediate said port and said tubular member adjacent the inboard end of said fluid-permeable portion so as to define a volume between said port and said tubular member;

a means connected to said tubular member adjacent the outboard end of said fluid-permeable portion for restricting the flow of fluid out of the outboard end of said tubular member; and

a means cooperating with said tubular member for removing particulates therefrom; wherein said fluid-permeable portion is a porous tube having pores sufficiently small to filter particulates of interest without unduly restricting the flow of fluid therethrough; and wherein said means for removing particulates from said tubular member is a rib-



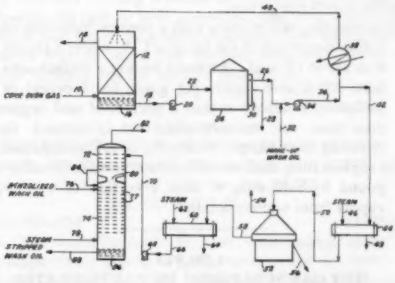
bon auger rotatably mounted in said tubular member for recycling the particulates to the reactor vessel.

4,286,971

REMOVAL OF NAPHTHALENE FROM RECIRCULATED WASH OIL

Kenneth R. Burcaw, Jr., Easton, and Robert E. Watkins, Jr., Bethlehem, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Oct. 5, 1979, Ser. No. 82,372
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—48 **9 Claims**



1. In a method for the final cooling of coke oven gas using a recirculating water immiscible wash solvent in which the coke oven gas is cooled by contact with the wash solvent in a final cooling tower, a naphthalene enriched wash solvent containing condensed water and solid material emerges from the cooling tower as an effluent and the effluent is split into a recirculated naphthalene enriched wash solvent flow which contains water and solids, and a water flow, the improvement comprising:

(a) removing a bleed stream of wash solvent from the naphthalene enriched wash solvent flow,

(b) continually and simultaneously centrifugally separating the wash solvent bleed stream of step (a) into a waste water stream, a sludge stream and a clean, dry wash solvent stream which is substantially free of solids and has a water content less than 0.5% (wt.),

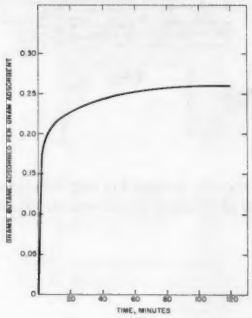
(c) heating the clean, dry wash solvent stream to a temperature of less than about 160° C., and

(d) stripping the naphthalene from the clean, dry wash solvent stream with steam to yield a stripped wash solvent.

4,286,972
VAPOR PHASE ADSORPTION USING NONSTOICHIOMETRIC CARBON-SULFUR COMPOUNDS

David W. Savage, Summit; Chin H. Chang, Edison, and John M. Longo, New Providence, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 3, 1978, Ser. No. 866,211
Int. Cl.[3] B01D *53/04*
U.S. Cl. 55—58 21 Claims



1. A process for regenerating a nonstoichiometric carbon-sulfur compound of the formula C_xS, where x ranges from about 4 to about 15, the adsorptive capacity of said compound having become reduced due to the adsorption of organic vapors thereon, which comprises removing at least a portion of said adsorbed vapors from said nonstoichiometric carbon-sulfur compound.

15. A process for removing organic vapors from a gaseous mixture which comprises

(a) contacting said mixture with a nonstoichiometric carbon-sulfur compound of the formula C_xS, where x ranges from 4 to about 15, said compound having a surface area of at least 300 square meters per gram, for a period of time sufficient to adsorb at least a portion of said organic vapors from said mixture onto said compound, thereby reducing the adsorptive capacity of said compound,

(b) regenerating said nonstoichiometric carbon-sulfur compound by removing at least a portion of said organic vapors from said compound.

4,286,973
WET GAS SCRUBBING OF PARTICULATES

Robert N. Hamlin, and William W. Dickinson, both of Duncan, Okla., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Feb. 22, 1980, Ser. No. 123,591
Int. Cl.[3] B01D *47/00*
U.S. Cl. 55—92 1 Claim

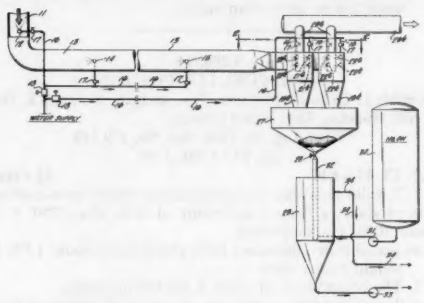
1. A method for removing particulates and acidic gases from flue gases comprising the steps of

(a) contacting said gases passing through a duct leading to a bank of two or more cyclone separators with a multiplicity of water sprays in said duct directed toward the incoming gas stream,

(b) contacting the gases as they enter said cyclones with a plurality of water sprays directed toward the incoming gas stream and in vertical aligment located inside said cyclones and having a spray configuration which ensures that essentially the entire cross-sectional area of the gases entering said cyclones are contacted,

(c) spraying water on the inside wall of said cyclones to flush particulates to the cyclone bottom for separation from said cyclones as a suspension of particulates in water, said flushing water being directed away from the incoming gas stream,

(d) removing off-gases from said cyclone, and

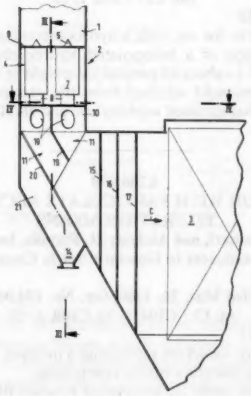


(e) neutralizing the aqueous suspension of particulates separated from said cyclone.

4,286,974
COMPOUND PARTICLE SEPARATOR

Heinz Schminke, Egelsbach, and Josef Schindling, Frankfurt am Main 80, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 5, 1980, Ser. No. 118,794
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1979, 2907081
Int. Cl.[3] B03C *3/01;* B01D *50/00*
U.S. Cl. 55—126 4 Claims



1. A compound dust-collecting plant comprising:

a horizontal-flow electrostatic precipitator having an intake side; and

a centrifugal separator mounted at said intake side of said electrostatic precipitator and including:

a downwardly extending raw gas inlet,

at least one horizontal row of a multiplicity of spaced apart centrifugal-separator cells disposed in said raw gas inlet and traversed downwardly and substantially vertically by a dust entraining raw gas, each of said cells including:

a vertical collecting tube with a respective upper gas inlet opening,

in said vertical tube near said inlet opening vane means for imparting a swirl to the gas traversing same, said inlet

openings being disposed above said electrostatic precipitator, and

an outlet tube coaxial with and disposed within said collecting tube proximal to the bottom thereof,

the lower end of each two adjacent outlet tubes being connected to a respective gas well having a pocket-like construction, each of said gas wells having

two vertical triangular side walls,

a roof-shaped top cover, and

an open outlet side near the inlet of the electroatatic precipitator;

an inclined dust chute disposed below the collecting tubes and between side walls of adjacent gas wells; and

a dust-collecting bin below the dust chutes, the horizontal distance between said wells being approximately equal to the width of each well.

4,286,975

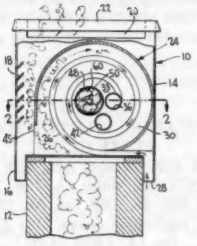
CHIMNEY HEAT EXCHANGER

Isaac C. Whiteley, 422 NE. 165th #24, Portland, Oreg. 97230

Filed Oct. 2, 1979, Ser. No. 81,180

Int. Cl.³ B01D *46/32;* **E04F** *17/02;* **F23J** *15/00;* **F28D** *7/14*

U.S. Cl. 55—269 **10 Claims**



1. A heat exchanger for installation on the top of a chimney of a building comprising

housing means having a lower end for receiving the top of a chimney having an effluent inlet therein for receiving effluent from the chimney and a fresh air inlet therein for receiving fresh air, a plenum and an upper end with openings therein; and

a heat exchanger assembly disposed in said housing means including a central chamber, duct means defining an effluent spiral path between said effluent inlet in said lower end of said housing means and said central chamber for carrying effluent from the top of the chimney to said central chamber and a fresh air spiral path between said fresh air inlet and said central chamber, effluent outlet means communicating with said effluent spiral path at said central chamber and with said plenum, and fresh air outlet means communicating with said fresh air spiral path at said central chamber, said effluent and fresh air spiral paths being in heat exchange relationship whereby the air passing through said fresh air spiral path is heated by the effluent passing through said effluent spiral path and can be used to heat the building.

4,286,976

COMBINED SOUND DAMPER AND OIL TRAP FOR A COMPRESSED AIR APPARATUS

Gunnar Eriksson, Högbyn, S-890 31, Arnäsvall, Sweden

Filed Jan. 18, 1980, Ser. No. 113,191

Claims priority, application Sweden, Jan. 29, 1979, 7900735

Int. Cl.³ B01D *50/00;* **F01N** *3/02*

U.S. Cl. 55—276 **8 Claims**

1. A combined sound damper and oil trap for compressed air apparatus, said sound damper and oil trap comprising:

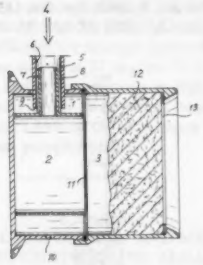
an oil collector housing;

a pressure chamber;

a filter housing;

a hose or tube adapted to be connected to the outlet of the compressed air apparatus and opening into said oil collector housing;

a scraper sleeve having an outer diameter which is less than the inner diameter of the said hose or tube, one end of said scraper sleeve being mounted in said hose or tube substantially centrally thereof so as to provide a narrow axial free space between the tube or hose and the scraper sleeve, and the opposite end of the scraper sleeve opening into said pressure chamber;



said pressure chamber being mounted under sealed condition within the oil collector housing and being connected to and opening into said filter housing, said filter housing being filled with a sound damping filter material and opening into the ambient air;

whereby oil which condensed on the inner surface of the tube or hose is collected and together with a small amount of air flowing through the tube or hose is received in the oil collector housing whereas the main portion of the air flowing the tube or hose passes through the scaper sleeve and is received in the pressure chamber from which the air passes through the sound damping filter material in the filter housing and out into the ambient air.

4,286,977

HIGH EFFICIENCY PARTICULATE AIR FILTER

Max Klein, 257 Riveredge Rd., Tinton Falls, N.J. 07724

Filed Oct. 15, 1979, Ser. No. 84,781

Int. Cl.³ B01D *39/14*

U.S. Cl. 55—524 **11 Claims**

1. A filter mat effective to filter air, which comprises in the below respectively indicated proportions to one another

(a) about 250 parts of glass micro-fibers admixed together composed of

(i) about 50 parts of such fibers about 6,300 microns long and about 4.3 microns in diameter,

(ii) about 50 parts of such fibers about 1,500 microns long and from about 2.17 to about 3.1 microns in diameter, and

(iii) about 150 parts of such fibers about 1,000 microns long and from about 0.49 to about 0.58 micron in diameter; all intertwined with

(b) from about 9.35 about 10 parts of a cobeat including

(i) from about 4.68 to about 5 parts of cellulose fibers and

(ii) from about 4.67 to about 5 parts of micro-bits of an expanded styrene-polymer, of an expanded polyolefin from the group from polyethylene through polymethylpentene or of a flexible polyurethane, the initial expanded form of each of which was non-brittle; and

(c) from zero to 2 parts of an organic binding agent distributed substantially uniformly throughout the intermixture of the intertwined cobeat and intermixed glass micro-fibers without destroying the air permeability of the filter, said binding agent (i) being inert to the constituents of the filter mat and to the fluid media that is to contact the mat, (ii) having its binding effectiveness initiated by heat, and (iii) being se-

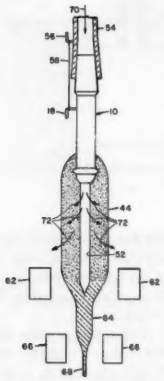
lected from (x) such binder insoluble in cold water and soluble in hot water and (y) any of the aqueous acrylic emulsions and polyvinyl chloride emulsions used as binders, and each of which binders (x) and (y) retains its binding function on cooling.

4,286,978

METHOD FOR SUBSTANTIALLY CONTINUOUSLY DRYING, CONSOLIDATING AND DRAWING AN OPTICAL WAVEGUIDE PREFORM

Alan C. Bailey, and Stephen B. Miller, both of Painted Post, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jul. 3, 1980, Ser. No. 165,651
Int. Cl.³ C03B *37/025, 37/075*
U.S. Cl. 65—3 A **7 Claims**



1. A method of forming an optical waveguide comprising the steps of

providing a porous soot preform suspended from one end of a substantially hollow longitudinal preform handle, said porous soot preform having a longitudinal aperture therein,

connecting the other end of said hollow preform handle to a source of gaseous drying medium,

flowing a quantity of said gaseous drying medium through said hollow handle, said aperture in said porous soot preform, and through the porous wall of said preform thereby drying the preform structure,

heating the extending end of said porous soot preform to the consolidation temperature of the materials thereof to progressively consolidate said preform from the extending end thereof,

heating the consolidated end of said preform to the drawing temperature of the materials thereof, and

drawing a filament from said extending end of the preform while said preform remains suspended from said preform handle.

4,286,979

FABRICATION OF OPTICAL FIBERS USING DIFFERENTIAL MODE-GROUP DELAY MEASUREMENT

Michael J. Buckler, Buford; Raymond B. Kummer, Norcross; Stephen C. Mettler, Decatur, and Calvin M. Miller, Lilburn, all of Ga., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

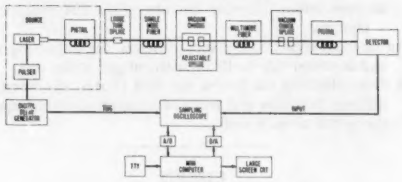
Filed Jun. 23, 1980, Ser. No. 162,263
Int. Cl.³ C03B *37/07, 37/075;* **G01N** *21/00*
U.S. Cl. 65—3 A **9 Claims**

1. In a method of forming a multimode optical fiber with improved mode dispersion characteristics comprising

thermochemically reacting gaseous glass precursor reactants to form a multimode optical fiber;

measuring the mode dispersion characteristics of the multimode fiber using a differential mode-group delay measurement technique;

altering, in accordance with the results of the measurement, the thermochemical reaction of the gaseous glass precursor reactants to form a multimode optical fiber with optimized mode dispersion characteristics,



the invention CHARACTERIZED IN THAT

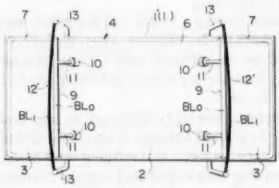
the differential mode-group delay measurement technique comprises launching light into the multimode fiber using a single mode fiber which is spliced to the multimode fiber using an adjustable splice comprising an index matching fluid.

4,286,980

METHOD AND APPARATUS FOR FORMING BENT PLATE GLASS

Kiyoto Matsuzaki, and Norimoto Aya, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 16, 1980, Ser. No. 150,529
Claims priority, application Japan, May 23, 1979, 54-63595
Int. Cl.³ C03B *23/027*
U.S. Cl. 65—106 **10 Claims**



1. A method of forming a bent plate glass, comprising in combination the following steps:

(a) positioning a flat glass plate upon a forming bed,

(b) heating said glass plate sufficiently so that said plate softens and conforms to the contour of said forming bed around the periphery thereof and further deforms slightly under its own weight;

(c) locally heating said glass plate along an initially curved heating line disposed outwardly from a desired bending line of said glass plate; and

(d) bending said glass plate along said initially curved heating line as said plate deforms, resulting in said heating line being transposed from its initial curved position to a position coincident with said desired bending line.

6. An apparatus for forming a bent plate glass, comprising:

(a) a fixed frame section;

(b) a moveable frame section rotatably connected to said fixed frame section; and

(c) an elongate curved heating element connected to said fixed frame section to locally heat a glass plate positioned on said apparatus, said heating element being so positioned to heat said glass plate along an initially curved heating

line, which heating line results in a desired transposed bending line due to heat deformation of said glass plate resulting in transposition of said initially curved heating line.

4,286,981

MOULD WITH SEPARATING LAYER FOR THE PRODUCTION OF GLASS OBJECTS

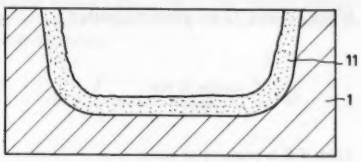
Rolf Clasen, Aachen, and Hans J. Lydtin, Stolberg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 27, 1979, Ser. No. 34,097

Claims priority, application Fed. Rep. of Germany, May 19, 1978, 2821871

Int. Cl.³ C03B *9/347*

U.S. Cl. 65—169 **9 Claims**



1. A mould for producing glass objects comprising a mould body for molding a glass blob, and a separating layer formed between said mould body and said glass blob to be formed, said separating layer comprising a defined wear layer of a high melting, corrosion and scale resistant pulverized granular material having a hardness ≧7 Mohs and an organic binder into which said material is embedded, said organic binder being converted into carbon at least at a surface of said layer in contact with said glass blob, and said layer having a thickness ranging from 10 um to 2 cm, whereby on contact said glass blob receives particles of said granular material.

4,286,982

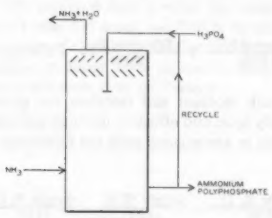
PROCESS OF MANUFACTURING STABLE AMMONIUM POLYPHOSPHATE FERTILIZERS

James S. Bremmer, R.R.#3, Box 561, O'Fallon, Mo. 63366

Filed Jul. 2, 1979, Ser. No. 53,748

Int. Cl.³ C05B *7/00*

U.S. Cl. 71—34 **5 Claims**



1. A process of manufacturing a stable ammonium phosphate fertilizer comprising preheating a feed stream of phosphoric acid, introducing the stream of heated phosphoric acid, at a temperature up to about boiling, to a countercurrent spray reactor having a spray nozzle on the inlet of the phosphoric acid, the spray nozzle being effective to atomize the phosphoric acid and to provide intimate contact between the phosphoric acid and ammonia at the input flow rate of the phosphoric acid; introducing the ammonia to the spray reactor in a preheated countercurrent stream at a temperature of between about 400 and 600 degrees F.; reacting the ammonia and phosphoric acid to form ammonium phosphate, and further heating the phosphoric acid and ammonia to a temperature sufficient to partially dehydrate the phosphoric acid, the phosphoric acid being at least partially dehydrated under the conditions of the spray reactor by the latent heat of the reactants and the heat of the reaction between the phosphoric acid and the ammonia, the spray reactor being operated under a partial vacuum effective to produce a flow through the reactor without entraining substantial phosphoric acid, the phosphoric acid being substantially converted to ammonium phosphate; separating the reactants, the ammonium phosphate product exiting at a temperature between about 300–400 degree F., the heat of the effluent ammonium phosphate being used to at least partially preheat the ammonia feed to the reactor; the resultant ammonium phosphate product containing sufficient ammonium polyphosphate to effectively stabilize the product at ambient temperatures for a time sufficient for storage, transportation and use, and at temperatures as low as 32 degrees F. for up to at least about three weeks and at temperatures as high as 120 degrees F. for up to at least about twenty-four hours; the product having above about 12.84% of the ammonium phosphate present as an ammonium polyphosphate.

4,286,983

ALGICIDAL COMPOSITION AND METHOD OF PREVENTING OR CONTROLLING ALGAE WITH SAID COMPOSITION

Jaap Van Gilse, and Gerard B. Paerels, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Netherlands

Filed Jul. 20, 1979, Ser. No. 59,420

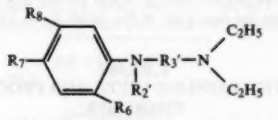
Claims priority, application Netherlands, Jul. 26, 1978, 7807908

Int. Cl.³ A01N *33/06*

U.S. Cl. 71—67 **6 Claims**

1. An algicidal composition comprising

an algically effective amount of a compound of the formula



wherein R_2' is H, methyl, or phenyl,

R_3' is ethylene, trimethylene, or 2-methyl-ethylene,

R_6 and R_8 are identical or different and are H, Cl, or methyl,

R_7 is Cl or methyl, with the provisos that (a) if R_6 and R_8 are both H, R_7 is in addition trifluoromethyl, n-C_2–C_{10}-alkyl, or cyclohexyl, (b) not all R_6, R_7, and R_8 are Cl, and (c) if R_6 and R_8 are H and R_7 is Cl, R_3' is ethylene, or a salt thereof and

a solid or liquid inert material.

4,286,984

COMPOSITIONS AND METHODS OF PRODUCTION OF ALLOY FOR TREATMENT OF LIQUID METALS

Leon A. Luyckx, 226 E. Hazelcroft Ave., New Castle, Pa. 16105

Filed Apr. 3, 1980, Ser. No. 136,885

Int. Cl.³ C21C *7/02*

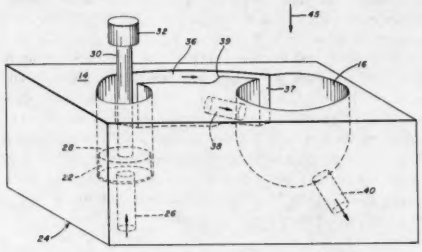
U.S. Cl. 75—58 **13 Claims**

1. An alloy essentially free from silicon and carbon for steel desulfurization and inclusion shape control consisting essentially of calcium and aluminum with iron, manganese, barium and alkali metals being present in amounts sufficient to provide desired characteristics associated with their presence, said aluminum being always present in at least a ratio by weight of Al:Ca=1:4, but not more than in a ratio of Al:Ca=1.5:1.

4,286,985
VORTEX MELTING SYSTEM

Jan H. L. Van Linden, Hamptown Township, Allegheny County, Pa., and Jeffrey B. Gorss, Newburgh, Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 31, 1980, Ser. No. 135,917
Int. Cl.[3] C22B *21/00*
U.S. Cl. 75—65 R **2 Claims**



1. An improved method of ingesting and melting metal scrap in a molten melting media, comprising:

providing a supply of the melting media,

directing melting media from the supply to the upper portion of a receptacle having an outlet opening in the lower portion,

directing the media into the receptacle in a manner that provides a free vortex of the media in the receptacle,

maintaining the flow of the media to the receptacle in a manner that provides a predetermined level of the media in the receptacle as the media flows from the receptacle through the opening in the lower portion thereof,

introducing metal scrap into the receptacle and media, and

dividing the media directed to the receptacle into two paths to disrupt the symmetry of the vortex in a manner that enhances the ingestion of the metal scrap into the media.

4,286,986
FERRITIC STAINLESS STEEL AND PROCESSING THEREFOR

Paul R. Borneman, Sarver, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Aug. 1, 1979, Ser. No. 62,821
Int. Cl.[3] C22C *38/26, 38/48*
U.S. Cl. 75—126 F **15 Claims**

1. A process for producing a creep resistant ferritic stainless steel, which comprises the steps of: preparing a steel melt containing, by weight, up to 0.1% carbon, up to 0.05% nitrogen, from 11 to 20% chromium, up to 5% aluminum, up to 5% molybdenum, up to 1.5% manganese, up to 1.5% silicon, up to 0.5% nickel, up to 0.5% copper, up to 0.6% titanium, and niobium and tantalum in accordance with the following:

(a) 0.63 to 1.15% effective niobium, in the absence of tantalum

(b) effective niobium and tantalum in accordance with the equation

$$\frac{\text{Effective Nb}}{0.9291} + \frac{\text{Effective Ta}}{1.8095} = 0.68 \text{ to } 1.24\%,$$

when both niobium and tantalum are present; casting said steel; working said steel; and annealing said steel at a temperature of at least 1900° F. to provide said steel with a creep life to one percent elongation at 1600° F. under a load of 1200 pounds per square inch, of at least 160 hours; said effective niobium and tantalum being computed in accordance with the following:

$$\frac{\text{weight \% Ti}}{47.90} - \frac{\text{weight \% N}}{14.01} - \frac{\text{weight \% C}}{12.01} = A$$

If A is positive or zero:
Then Effective Nb content = weight % Nb
Effective Ta content = weight % Ta
If A is negative:
Then When Ta is absent
Effective Nb content =

$$92.91\left(\frac{\text{weight \% Nb}}{92.91} + A\right)$$

When Nb and Ta are present together

$$92.91\left(\frac{\text{weight \% Nb}}{92.91} + A\right) = B$$

Then if B is positive or zero:
Effective Nb content = B
Effective Ta content = weight % Ta
If B is negative:
Effective Nb content = 0
Effective Ta content =

$$180.95\left(\frac{\text{weight \% Ta}}{180.95} + \frac{\text{weight \% Nb}}{92.91} + A\right).$$

8. A ferritic stainless steel consisting essentially of, by weight, up to 0.1% carbon, up to 0.05% nitrogen, from 11 to 20% chromium, up to 5% aluminum, up to 5% molybdenum, up to 1.5% manganese, up to 1.5% silicon, up to 0.5% nickel, up to 0.5% copper, up to 0.6% titanium, and niobium and tantalum in accordance with the following:

(a) 0.63 to 1.15% effective niobium, in the absence of tantalum

(b) effective niobium and tantalum in accordance with the equation

$$\frac{\text{Effective Nb}}{0.9291} + \frac{\text{Effective Ta}}{1.8095} = 0.68 \text{ to } 1.24\%,$$

when both niobium and tantalum are present, balance essentially iron; said effective niobium and tantalum being computed in accordance with the following:

$$\frac{\text{weight \% Ti}}{47.90} - \frac{\text{weight \% N}}{14.01} - \frac{\text{weight \% C}}{12.01} = A$$

If A is positive or zero:
Then Effective Nb content = weight % Nb
Effective Ta content = weight % Ta
If A is negative:
Then When Ta is absent
Effective Nb content =

$$92.91\left(\frac{\text{weight \% Nb}}{92.91} + A\right)$$

When Nb and Ta are present together

$$92.91\left(\frac{\text{weight \% Nb}}{92.91}+A\right)=B$$

Then if B is positive:
Effective Nb content = B
Effective Ta content = weight % Ta
If B is negative:
Effective Nb content = 0
Effective Ta content =

$$180.95\left(\frac{\text{weight \% Ta}}{180.95}+\frac{\text{weight \% Nb}}{92.91}+A\right)$$

said steel having a creep life to one percent elongation at 1600° F. under a load of 1200 pounds per square inch, of at least 160 hours.

4,286,987

COMPOSITION FOR IRON POWDER COMPACT INFILTRANT

Paul E. Matthews, Lawrenceville, N.J., assignor to United States Bronze Powders, Inc., Flemington, N.J.

Filed Nov. 28, 1979, Ser. No. 97,904
Int. Cl.³ B22F *1/00*; C23C *3/00*
U.S. Cl. 75—252 **7 Claims**

1. A dry compactible infiltrant composition for impregnating iron and iron base alloy powder compacts, said composition consisting of a copper-iron mixture containing by weight about 97% to 99% copper or copper base alloys having a particle size less than 60 mesh and about 1% to 3% carbonyl iron powder having a particle size finer than 325 mesh, and between about 0.01% to 0.10% by weight of said mixture of aluminum, to effectively reduce residual formation to about 5.5% or less by weight and optionally containing a lubricant.

5. A dry compactible infiltrant composition for impregnating iron and iron base alloy powder compacts, said composition consisting essentially of a copper-iron mixture containing by weight about 97% to 99% copper or copper base alloy and about 1% to 3% carbonyl iron powder by weight having a particle size finer than 325 mesh, and 0.01% to about 0.1% by weight as aluminum of aluminum stearate to effectively reduce residual formation to about 5.5% or less by weight and substantially reduce adhesion after infiltration.

4,286,988

COPPER BASE ANTIFOULING PAINTS WITH PH CONTROL

Vincent J. Castelli, Severna Park, and Eugene C. Fischer, Arnold, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 30, 1980, Ser. No. 164,450
Int. Cl.³ C09D *5/14*
U.S. Cl. 106—15.05 **12 Claims**

1. In a copper base antifouling paint containing a film-forming vehicle and a cuprous source as the toxic agent, the improvement comprising 0.001 to 20 weight percent of $(NH_4)_2SO_4$ based upon the weight of the cuprous source.

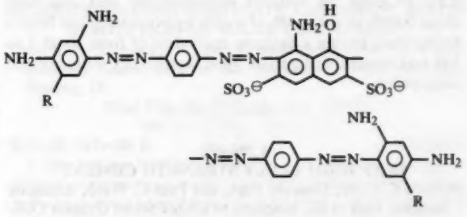
4,286,989

FORMULATIONS FOR INK JET PRINTING

Leo J. Kadehjian, Woodside, Calif.; Harbans S. Sachdev, Wappingers Falls, N.Y., and Clinton D. Snyder, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1980, Ser. No. 192,270
Int. Cl.³ C09D *11/00*
U.S. Cl. 106—22 **7 Claims**

1. An ink for use in ink jet printing comprising an aqueous solution of a coloring material having the formula



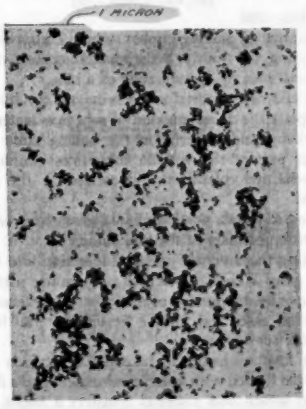
where R is $-OCH_2CO_2^-$, $-CH_2CO_2^-$, $-PO_3^=$ or $-CH_2-PO_3^=$.

4,286,990

TEMPERATURE STABILIZED, PYROGENICALLY PRODUCED ALUMINUM OXIDE-MIXED OXIDE, THE PROCESS FOR ITS PRODUCTION AND USE

Peter Kleinschmit, Hanau, and Rudolf Schwarz, Alzenau, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 31, 1980, Ser. No. 174,342
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1979, 2931585
Int. Cl.³ C04B *35/10*
U.S. Cl. 106—73.4 **16 Claims**



1. Temperature stabilized, pyrogenically produced aluminum oxide-silicon dioxide mixed oxide having a BET surface area of 50 to 200 m^2/g, the silicon dioxide being 0.5 to 20 weight % of the mixed oxide, the balance of the mixed oxide consisting essentially of aluminum oxide.

4,286,991

VERY HIGH EARLY STRENGTH CEMENT

Richard E. Galer, Hanover Park, and Paul C. Webb, Arlington Heights, both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Apr. 25, 1980, Ser. No. 143,666
Int. Cl.³ C04B 7/352
U.S. Cl. 106—90 14 Claims

1. A hydraulic cement composition comprising from about 3.75% to about 40% of the compound $3CaO,3Al_2O_3.CaSO_4$, from about 0.1% to about 5% of lime and from about 3% to about 35% of calcium sulfate, dicalcium silicate, from about 0.1% to about 2% hydroxy polycarboxylic acid, and from about 0.25% to about 4% of starch hydrolyzate solids from a hydrolyzate having a dextrose equivalent of from about 1 to 100, said amounts being based upon the total dry weight of said composition.

4,286,992

VERY HIGH EARLY STRENGTH CEMENT

Richard E. Galer, Hanover Park, and Paul C. Webb, Arlington Heights, both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Apr. 25, 1980, Ser. No. 143,667
Int. Cl.³ C04B 7/352
U.S. Cl. 106—90 20 Claims

1. A hydraulic cement composition comprising from about 3.75% to about 40% of $3CaO.3Al_2O_3.CaSO_4$, from about 0.1% to about 5% of lime, from about 3% to about 35% of calcium sulfate, dicalcium silicate, from about 0.1% to about 2% of a hydroxy polycarboxylic acid, and from about 0.25% to about 4% of sucrose, said amounts being based upon the total dry weight of said composition.

4,286,993

METHOD AND INSTALLATION FOR MAKING CEMENT CLINKER

Jean P. Lovichi, and Bernard le Bras, both of Montelimar, France, assignors to LaFarge Conseils et Etudes, Paris, France

Filed Jan. 4, 1980, Ser. No. 109,528
Claims priority, application France, Jan. 9, 1979, 79 00394
Int. Cl.³ C04B 7/02
U.S. Cl. 106—106 2 Claims

1. A method of making clinker, which comprises:

introducing previously decarbonated cement-making raw material into the baking zone of a kiln,

baking said raw material under reducing conditions so as to complete the decarbonation of said raw material,

clinkerizing said material in the baking zone whereby a major part of the volatile substances contained in said material are volatilized and carried by the combustion gases,

diverting at least a portion of said gases from said kiln at a location upstream of the said baking zone,

quenching the diverted gases by injecting into the flow of said gases a cool powderous or granular material to remove at least a portion of the volatile substances from the diverted gases and form a heated material loaded with volatile substances,

causing heat exchange to take place between the heated material loaded with volatile substances and a flow of cool air to which said material transfers a major part of its thermal energy while being cooled,

re-introducing at least a portion of the thus cooled material into the flow of combustion gases diverted at said location upstream of the baking zone, and

removing the non re-introduced part of said material from the circuit.

4,286,994

METHOD FOR THE USE OF THE GYPSUM OCCURRING IN FLUE GAS DESULFURIZING INSTALLATIONS, OPERATED ON A LIME BASIS

Rudolf Müller, Friedrichsthal; Hans-Guido Klinkner, St. Ingbert, and Günter Culmann, Neunkirchen, all of Fed. Rep. of Germany, assignors to Saarbergwerke A.G., Saarbrucken, Fed. Rep. of Germany

Filed Jul. 30, 1979, Ser. No. 62,074
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1978, 2833382
Int. Cl.³ C04B 11/00
U.S. Cl. 106—109 5 Claims

1. Method for the use of flue gas desulfurizing gypsum occurring in flue gas desulfurizing installations operated on a lime basis, comprising mixing the flue gas desulfurizing gypsum with dehydrated natural gypsum after its partial or complete dehydration.

4,286,995

MICA-FREE JOINT COMPOUND

Richard E. Smith, Williamsville, and William R. Burke, Tonawanda, both of N.Y., assignors to National Gypsum Company, Dallas, Tex.

Filed Mar. 27, 1980, Ser. No. 134,701
Int. Cl.³ C04B 11/00
U.S. Cl. 106—109 10 Claims

1. A joint compound for concealing the joints between wallboards, consisting essentially of a filler, a binder, additives for providing working properties during application to a wallboard when mixed with water, and a special additive for minimizing shrinkage during drying, said special additive consisting of calcium sulfate dihydrate, said calcium sulfate dihydrate comprising a substantial portion of individual crystals having a length to width ratio of about 1.0 to 1.5, with the length being about 50 to 100μ.

4,286,996

BITUMINOUS COMPOSITE REINFORCED WITH A FILLER COATED WITH THE REACTION PRODUCT OF A BITUMEN AND AN ORGANO METALLIC COMPOUND

Alfred Marzocchi; Michael G. Roberts, and Charles E. Bolen, all of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 48,220, Jun. 13, 1979, Pat. No. 4,246,314. This application May 5, 1980, Ser. No. 146,817
Int. Cl.³ B32B 11/00; C08L 95/00
U.S. Cl. 106—282 3 Claims

1. A reinforced composite comprising a bitumen as a continuous phase and, as reinforcement in the bitumen, a filler selected from the group consisting of natural and synthetic fillers having a coating thereon, said coating comprising the reaction product of (a) bitumen and (b) an organo metallic compound selected from the group consisting of an orthoester and a borate ester.

4,286,997

BITUMINOUS COMPOSITE REINFORCED WITH A FILLER COATED WITH THE REACTION PRODUCT OF A BITUMEN AND A CHROMIUM COMPLEX

Alfred Marzocchi; Michael G. Roberts, and Charles E. Bolen, all of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 55,738, Jul. 9, 1979, Pat. No. 4,251,577. This application Jun. 19, 1980, Ser. No. 160,885
Int. Cl.³ B32B 11/00; C08L 95/00
U.S. Cl. 106—282 3 Claims

1. A reinforced composite comprising a bitumen as a continuous phase and, as reinforcement in the bitumen, a filler selected from the group consisting of natural and synthetic fillers

having a coating thereon, said coating consisting essentially of the reaction product of (a) bitumen and (b) a chromic complex

containing a carboxylato group containing a functional group reactive with the bitumen.

4,286,998

LIGHT STABLE QUINACRIDONEQUINONE YELLOW PIGMENT

Wilfried G. Höltje; George H. Senkler Jr., and Arthur J. Taggi, all of Wilmington, Del., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 70,835, Aug. 29, 1979, which is a continuation-in-part of Ser. No. 969,533, Dec. 14, 1978, abandoned. This application May 27, 1980, Ser. No. 153,208
Claims priority, application Canada, Dec. 3, 1979, 341100
Int. Cl.³ C08H *17/14*
U.S. Cl. 106—288 Q **12 Claims**

1. A pigment comprising a solid solution of
(a) 1–20% by weight based on the total of (a) and (b) of a stabilizer selected from the group consisting of 2-anilinoacridone, 5,6,7,8-tetrahydro-2-anilinoacridone, 6-anilinoquinolone, and 2-aminoacridone or mixtures thereof; and
(b) 80–99% by weight of quinacridonequinone.

4,286,999

METHOD OF IMPROVING PROPERTIES OF CERAMIC FIBERS

Jerry Zucker, Charleston, S.C., assignor to Raybestos-Manhattan, Inc., Trumbull, Conn.

Filed Mar. 4, 1980, Ser. No. 127,235
Int. Cl.³ C04B *31/44*
U.S. Cl. 106—308 Q **7 Claims**

1. A process for improving the water dispersibility of ceramic fibers comprising the step of applying a coating to said fibers, said coating comprising a mixture of a coupling agent consisting of hydrolyzable silanes, titanates and mixtures thereof and an ionic surfactant, said coupling agent and surfactant being added in amounts sufficient to render the ceramic fiber water dispersible.

4,287,000

GRINDING OF PIGMENTS

Geoffrey R. Buckwalter, Flemington, N.J., assignor to Eric Simon, Houston, Tex.

Filed Dec. 26, 1979, Ser. No. 106,410
Int. Cl.³ C04B *47/04*
U.S. Cl. 106—309 **6 Claims**

1. In salt grinding of pigments, the improvement comprising
(a) milling oversize crude organic pigment with an inorganic salt and an organic conditioner until a predetermined state of pigmentary quality is obtained;
(b) dispersion of the above mixture in a dispersing medium to provide a smooth suspension;
(c) separating the resulting suspension into a liquid phase consisting of properly sized pigment, conditioner, and some salt and a sediment phase comprising the major portion of the salt, conditioner, and a small part of the pigment;
(d) returning the sediment phase to step a for a subsequent batch in a new grinding cycle with new unfinished pigment;
(e) separating the pigment from said liquid phase by filtration after addition of some water and flocculating agent to form press cake;
(f) washing the resulting press cake free of conditioning agent and salt with water; and
(g) combining filtration liquor from step e and wash water from step f and evaporating the water from the conditioning agent leaving a mass of conditioning agent and some salt in the unit;
wherein organic conditioner is used as the dispersing medium in step b.

4,287,001

ESTERIFIED ALUMINOSILICATE ADSORBENT AS FOR RESOLUTION OF SUGAR COMPONENTS

Santi Kulprathipanja, Hoffman Estates, and Richard W. Neuzil, Downers Grove, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Feb. 25, 1980, Ser. No. 124,397
Int. Cl.³ C13K *3/00, 11/00*
U.S. Cl. 127—46 B **10 Claims**

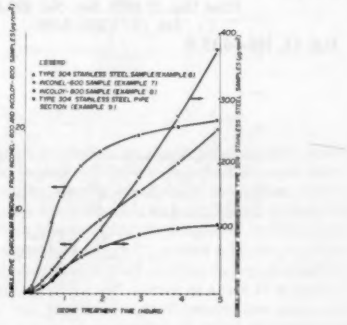
1. In a process for the separation of a component from a feed mixture comprising an aqueous solution of a mixture of components by contacting said solution with an adsorbent comprising a crystalline aluminosilicate exhibiting an adsorptive selectivity towards said component bound with an inorganic oxide binder material, thereby selectively adsorbing said component from said mixture, and thereafter recovering said adsorbed component, the silicon constituent of said crystalline aluminosilicate or said binder material tending to dissolve in said solution resulting in the undesirable disintegration of said crystalline aluminosilicate or said binder material, the improvement which comprises contacting said adsorbent, prior to said contacting with said aqueous solution, with an alcohol at esterification reaction conditions, thereby effecting an esterification reaction between said crystalline aluminosilicate or said binder material and said alcohol which substantially reduces the extent of dissolution of said silicon constituent and the extent of said disintegration of said crystalline aluminosilicate or said binder material.

4,287,002

NUCLEAR REACTOR DECONTAMINATION

John Torok, Deep River, Canada, assignor to Atomic Energy of Canada Ltd., Ottawa, Canada

Filed Apr. 9, 1979, Ser. No. 28,200
Int. Cl.³ B08B *7/04*
U.S. Cl. 134—3 **19 Claims**



1. A method of decontaminating and removing corrosion products at least some of which are radioactive, from nuclear reactor surfaces exposed to coolant or moderator, said surfaces containing acid-insoluble metal oxides, including chromium oxide, rendered more soluble by oxidation, comprising:
(a) contacting the contaminated surfaces with ozone to an extent sufficient to oxidize insoluble surface metal oxide or

oxides, oxides of said metals being thereby rendered more soluble in water or acidic decontaminating solutions;
(b) dissolving the solubilized surface metal oxides in an aqueous liquid;
(c) dissolving or detaching the remaining surface oxides into aqueous liquid containing oxide-removing acidic decontaminating reagents;
(d) removing insoluble particulate material from the resulting aqueous liquids;
(e) removing dissolved metals from the resulting aqueous liquids; and
(f) removing both residual dissolved metals and reagents from the reactor system to complete the decontamination.

4,287,003

STABILIZATION OF CHLORINATED ALIPHATIC HYDROCARBONS

Christopher S. Allen, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jul. 18, 1979, Ser. No. 58,443

Claims priority, application United Kingdom, Jul. 27, 1978, 31314/78; Jul. 27, 1978, 31316/78

Int. Cl.³ B08B *3/08;* **C07C** *17/42;* **C11D** *7/50;* **C23G** *5/02*

U.S. Cl. 134—31 **12 Claims**

1. A method of degreasing metal and other articles which comprises bringing the articles into contact with a solvent selected from the group consisting of trichloroethylene, perchloroethylene and methylene chloride in the vapor phase wherein said solvent has been stabilized with a stabilizing amount of an epoxy alkyl ester which is derived from a carboxylic acid containing 5 to 22 carbon atoms and from an alcohol containing 3 to 12 carbon atoms.

6. A method as claimed in claim **1** or claim **5** in which the stabilizer for the solvent is a mixture of epoxy alkyl esters derived from long chain fatty acids and glycerol.

7. A method as claimed in claim **6** in which the stabilizer for the solvent is an epoxidized vegetable oil.

4,287,004

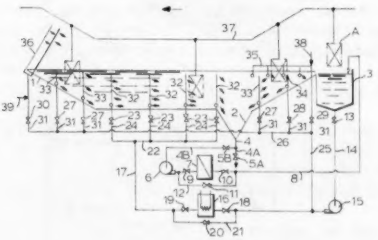
DIP PHOSPHATING PROCESS

Ryoichi Murakami; Hideo Shimizu, and Syuzi Sato, all of Neyagawa, Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Dec. 5, 1979, Ser. No. 100,409

Int. Cl.³ C23F *7/08*

U.S. Cl. 148—6.15 R **6 Claims**



1. A dip phosphating process, which comprises introducing a substrate to be phosphated into a bath containing a phosphating solution, while undulating, without splashing, the phosphating solution at the entrance section of the bath, wherein the substrate is washed by spouting a phosphating solution and/or water thereto when the substrate is taken out of the phosphating solution in the bath at the exit section.

4,287,005

INSTANTANEOUS SCARFING BY MEANS OF A PILOT PUDDLE

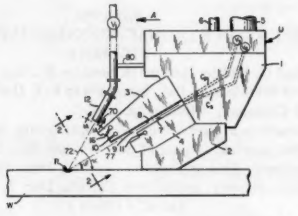
Stephen A. Engel, Granite Springs, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 91,162, Nov. 5, 1979, Pat. No. 4,243,436, which is a continuation of Ser. No. 24,597, Mar. 28, 1979, abandoned. This application Mar. 4, 1980, Ser. No. 121,606

The portion of the term of this patent subsequent to Jan. 6, 1998, has been disclaimed.

Int. Cl.³ B23K *7/00*

U.S. Cl. 148—9.5 **23 Claims**



1. A process for spot scarfing the surface of a metal workpiece comprising:
(a) impinging a stream of pilot oxygen gas upon a portion of the workpiece surface which is at least at its oxygen ignition temperature thereby causing a thermochemical reaction for providing a pilot puddle of molten metal on the surface of the workpiece;
(b) causing relative motion between said workpiece and said stream of pilot oxygen gas, so as to continuously produce said pilot puddle of molten metal having a width of about 10 to 30 mm along a chosen path on the surface of the workpiece;
(c) contacting said pilot puddle with a stream of oxygen gas having a first intensity higher than the intensity of a stream of scarfing oxygen gas so as to spread the puddle to a preselected width of about 100 to 300 mm when said puddle reaches an area to be spot scarfed on said workpiece;
(d) reducing said first intensity of said stream of oxygen gas of step (c) to a second intensity of up to the intensity of said stream of scarfing oxygen gas upon said puddle being spread to said preselected width; and
(e) scarfing said area by impinging said stream of scarfing oxygen gas on the spread puddle.

8. An apparatus for spot scarfing a metal workpiece comprising:
(a) a scarfing unit comprising:
(i) an upper preheat block having a lower surface;
(ii) a lower preheat block having an upper surface positioned below said lower surface of said upper preheat block and spaced therefrom to form a slot-like nozzle for directing a sheet-like stream of oxygen gas at scarfing intensity at said workpiece surface;
(b) pilot oxygen nozzle means with a central axis directed to intersect said workpiece surface at an acute angle for discharging a stream of pilot oxygen gas at said workpiece surface to form a pilot puddle thereon;
(c) blowpipe means, having a discharge orifice with a shape factor of from 4π to about 25 and with a central axis directed to intersect said workpiece surface at an acute angle, for discharging a stream of oxygen gas having a first intensity higher than said scarfing oxygen intensity and being directed at said pilot puddle on said workpiece surface; and
(d) means for reducing said first intensity of said stream of oxygen gas of (c) to a second intensity of up to said scarfing oxygen intensity.

4,287,006

ANNEALING SEPARATOR FOR GRAIN ORIENTED SILICON STEEL STRIPS

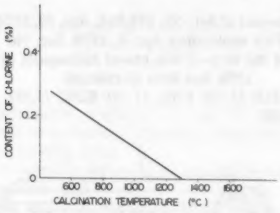
Yoshitaka Hiromae; Kazuo Nakamura, and Hajime Nitto, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 27, 1979, Ser. No. 98,118

Claims priority, application Japan, Nov. 28, 1978, 53/146101; Apr. 11, 1979, 54/42961; Jun. 7, 1979, 54/70569; Aug. 22, 1979, 54/106799

Int. Cl.[3] C04B *35/04;* B23K *35/24*

U.S. Cl. 148—27 10 Claims



1. An annealing separator for grain oriented silicon steel strips, comprising (1) non-hydrating magnesium oxide which has been calcined at a temperature of 1300° C. or more and which is in the form of fine particles, 70% by weight or more of which particles have a size of 5 microns or less, and (2) at least one member selected from the group consisting of magnesium hydroxide in an amount of from 1 to 100%, based on the weight of said magnesium oxide, and aluminum compounds in an amount of from 0.05 to 10%, based on the weight of said magnesium oxide.

4,287,007

STEEL COMPOSITION CHIPPER KNIFE

George F. Vander Voort, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed May 29, 1979, Ser. No. 43,069

Int. Cl.[3] C21D *9/18*

U.S. Cl. 148—36 9 Claims

1. A quenched and tempered ferrous alloy chipper knife comprising a generally rectangular bar having a beveled cutting edge, said ferrous alloy consisting essentially of, by weight, carbon between about 0.40 and 0.60%, a maximum of about 1.0% manganese, a maximum of about 0.035% phosphorus, a maximum of about 0.035% sulfur, a maximum of about 1.50% silicon, a maximum of about 2.00% nickel, chromium between about 4.0 and 6.0%, molybdenum between about 1.0 and 3.0%, a maximum of about 0.10% aluminum, and the balance essentially iron, said knife characterized by a level of toughness of at least 100 ft-lbs on unnotched specimens, and hardness of at least 56 HRC.

4,287,008

METHOD OF IMPROVING THE DUCTILITY OF THE COATING OF AN ALUMINUM-ZINC ALLOY COATED FERROUS PRODUCT

Theodore E. Torok, Springtown; Paik W. Shin, Coopersburg, and Angelo R. Borzillo, Norristown, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Nov. 8, 1979, Ser. No. 92,786

Int. Cl.[3] C23C *1/02;* C22C *21/10;* C23F *17/00*

U.S. Cl. 148—127 4 Claims

3. A method of producing an aluminum-zinc alloy coated ferrous product to improve the ductility of the coating, said as-cast coating comprising (1) an alloy overlay of cored aluminum-rich dendrites and zinc-rich interdendritic constituents, and (2) an intermetallic layer intermediate said overlay and the ferrous base, characterized by the steps of thermally treating said coated ferrous product by heating to a temperature between about 400° F. (205° C.) and 800° F. (427° C.) and holding at said temperature for a minimum of time as calculated by the following equation:

$$\log t = \frac{7102.4}{T} - 11.04,$$

where t=time in seconds, and T=heating temperature in °K; cooling from said temperature at a rate no faster than about 1° F./minute down to 400° F. (205° C.), and thereafter cooling to ambient temperature at a rate to precipitate incoherent overaged second phase particles in said overlay.

4,287,009

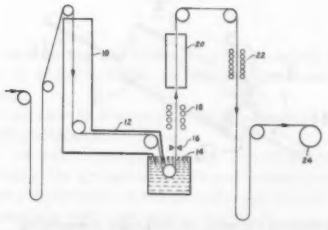
METHOD OF PRODUCING AN ALUMINUM-ZINC ALLOY COATED FERROUS PRODUCT TO IMPROVE CORROSION RESISTANCE

Louis K. Allegra, Bethlehem; Herbert E. Townsend, Center Valley, and Angelo R. Borzillo, Norristown, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Nov. 8, 1979, Ser. No. 92,787

Int. Cl.[3] C22F *1/04;* C23F *17/00*

U.S. Cl. 148—127 9 Claims



7. A method of producing an aluminum-zinc alloy coated ferrous product to improve the atmospheric corrosion behavior of the coating by altering its corrosion mechanism, characterized by the steps of coating said ferrous product with molten aluminum-zinc alloy comprising, by weight, 25 to 70% aluminum, balance essentially zinc with a small addition of silicon, cooling said aluminum-zinc alloy coating during substantially the entire solidification of said coating at a rate of at least 20° F./sec. (11° C./sec.) to produce an aluminum-zinc alloy coating comprising (1) an alloy overlay of cored aluminum-rich dendrites and zinc-rich interdentritic constituents, and (2) an intermetallic layer intermediate said overlay and the ferrous base, arresting said cooling and holding said coated ferrous product at a temperature within the single phase region for the composition of said aluminum-zinc alloy, defined as α in FIG. 1 in the accompanying drawings, for a sufficient time to cause dissolution of said interdendritic zinc-rich constituents in said alloy coating overlay, and cooling the coated ferrous product

slowly to about 350° F. (177° C.), whereby to produce a coating overlay structure of a fine dispersion of zinc within an aluminum-rich matrix.

4,287,010

EMULSION-TYPE EXPLOSIVE COMPOSITION AND METHOD FOR THE PREPARATION THEREOF

James H. Owen, II, Hagerstown, Md., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Aug. 6, 1979, Ser. No. 64,172
Int. Cl.³ C06B *45/00*
U.S. Cl. 149—2 **23 Claims**

1. A method of producing an emulsion-type blasting composition comprising combining an aqueous solution of an inorganic oxidizing salt and a carbonaceous fuel in the liquid phase with agitation in the presence of a fatty acid and ammonium or alkali metal hydroxide, and incorporating dispersed gas bubbles or voids in the resulting water-in-oil emulsion.

15. An emulsion-type explosive composition comprising:

(a) a carbonaceous fuel forming a continuous emulsion phase;

(b) an aqueous solution of an inorganic oxidizing salt forming a discontinuous emulsion phase dispersed within said continuous phase;

(c) dispersed gas bubbles or voids comprising at least about 5 percent of the volume of said composition;

(d) an ammonium or alkali metal salt of a fatty acid;

(e) a fatty acid; and

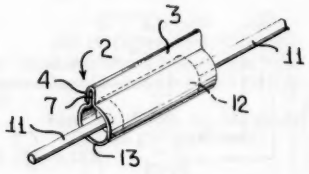
(f) an ammonium or alkali metal hydroxide in an amount in excess of that which will form by the hydrolysis of said fatty acid salt in water.

4,287,011

CLOSURE METHOD

Rodney L. Derbyshire, North Port, N.Y., assignor to Radiation Dynamics, Inc., Melville, N.Y.

Filed May 11, 1979, Ser. No. 38,070
Int. Cl.³ B32B *1/08*; B29C *27/00*; B29B *27/24*
U.S. Cl. 156—85 **5 Claims**



1. The method of forming an enclosure comprising

forming an enclosure about an object from a material that has size memory and which, prior to forming the enclosure, has been heated above its crystalline melt point, expanded and cooled so that the material remains expanded until reheated,

closing at least one side of the enclosure with the enclosure being at least as large as the object prior to reheating of the material and being smaller than the object after contraction,

the closure being formed as a double bond between end regions of the material with one end region having a main region and a flap extending from the main region,

disposing the other of the end regions between the flap and the main region of the one end region,

forming bonds between adjacent surfaces of said end regions one to the other of lesser strength of peel than the strength of the material of the end regions, and

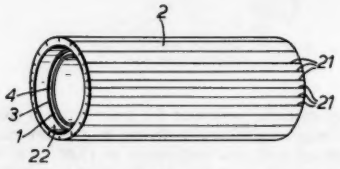
reheating the material of the enclosure above its crystalline melt point whereby the enclosure shrinks to a size smaller than such object to produce at least partial failure of the peel bond.

4,287,012

RECOVERABLE ARTICLES

John A. Midgley, San Carlos, and David D. Nyberg, Sunnyvale, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 895,064, Apr. 10, 1978, Pat. No. 4,179,320. This application Apr. 6, 1979, Ser. No. 27,780
The portion of the term of this patent subsequent to Dec. 18, 1996, has been disclaimed.
Int. Cl.³ B32B *31/00*; F16L *11/00*; B29C *13/00, 27/00*
U.S. Cl. 156—86 **48 Claims**



1. A flexible, shrinkable, hollow article which comprises

(1) a hollow inner member which is composed of an elastomeric material and which is in a radially extended condition; and

(2) a hollow outer restraining means

(a) whose inner surface is secured to the outer surface of said inner member and which maintains said inner member in said radially extended condition, said inner and outer surfaces being secured to each other by a bond whose peel strength is less than 50 lb. per linear inch width at 21° C.;

(b) whose outer surface forms the outer surface of said article and is free of score lines whose depth is 5 to 90% of the thickness of the restraining means; and

(c) is composed of a material which

(i) has a 2% secant modulus at 21° C. of 4,000 to 120,000 psi;

(ii) has an ultimate elongation at 21° C. of at least 20% at a separation speed of 200% per minute and at most 150% at a separation speed of 2,000% per minute; and

(iii) has a notch sensitivity such that when there is formed in the outer surface of the restraining means a score line whose depth is 5 to 90% of the thickness of the restraining means, then by distorting the article so as to exert a bending moment about the axis of the score line, the depth of said score line can be substantially increased.

40. A method of covering a substrate which comprises:

(a) forming at least one score line in the outer surface of the restraining means of a flexible, shrinkable hollow article as claimed in any of claims **1**, **11**, **15**, **18**, **19**, or **24**, said score line having a depth of 5 to 90% of the thickness of the restraining means;

(b) after the step of forming, distorting the article to exert a bending moment about the axis of the score line, thereby substantially increasing the depth of said score line;

(c) placing the article around the substrate; and

(d) pulling away from the inner member a section of the restraining means adjacent a score line whose depth has been increased by the step of distorting for recovery of the inner member toward the substrate.

4,287,013

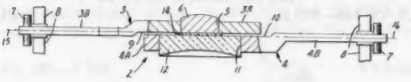
COMFORMABLE, MULTILAYERED TAPE ADHERENT ON ONE SURFACE TO FUSABLE METAL ALLOYS AND ON THE OTHER SURFACE TO OPHTHALMIC LENS BLANKS

Albert J. Ronning, North Oaks, Minn., assignor to Minnesota Mining & Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 36,878, May 8, 1979, abandoned. This application May 1, 1980, Ser. No. 145,588

Int. Cl.³ B32B *31/00, 33/00;* **C09J** *7/02*

U.S. Cl. 156—242 **25 Claims**



1. A conformable, multilayered tape for bonding fusible metal alloy to an opthalmic lens blank which comprises

a polymer backing layer,

a pressure sensitive adhesive on one major surface of said backing layer, and

a tack-free adhesion-promoting layer on the other major surface of said backing,

wherein, when said tape is interposed between an ophthalmic lens blank and a fusible metal alloy so that said adhesive contacts said lens blank and said adhesion-promoting layer contacts said fusible metal alloy, the bond strength between said alloy and said lens blank is greater than the bond strength between said alloy and said lens blank if said tape were not present; and

wherein said tape has a 2% secant modulus in the range of about 35 kg/cm^2 to 20,000 kg/cm^2, a sheer value of at least about 10 minutes, a 180° peel value in the range of about 60 g/cm width to 1400 g/cm width, a percent elongation at break in the range of about 45% to 1,000% and a lap shear value of at least about 5 kg/cm^2.

25. A method of adhering a fusible metal alloy to a compound surface of an ophthalmic lens blank comprising

applying the pressure-sensitive adhesive portion of a section of the conformable multilayered tape according to claim **1** to the entirety of a compound surface of an ophthalmic lens blank;

conforming said tape to said surface so that said tape is free from wrinkles, air bubbles and other discontinuities in the bond between said tape and said lens blank; and

applying a fusible metal alloy to at least a portion of the adhesion-promoting layer of said tape.

4,287,014

NOVEL CROSSLINKABLE RESIN COMPOSITION AND METHOD FOR PRODUCING A LAMINATE USING SAID COMPOSITION

Morio Gaku, Saitama; Norio Nagai, and Yasunari Osaki, both of Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Dec. 27, 1979, Ser. No. 107,614

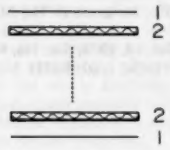
Claims priority, application Japan, Dec. 27, 1978, 53-163332; Dec. 27, 1978, 53-163333; Dec. 27, 1978, 53-163334; Dec. 27, 1978, 53-163335; Dec. 28, 1978, 53-164298; Dec. 28, 1978, 53-164299

Int. Cl.³ C09J *5/06*

U.S. Cl. 156—306.9 **6 Claims**

1. A crosslinkable resin composition comprising (A) 95 to 5% by weight of a polyethylene homopolymer resin composition containing 0.1 to 10% by weight of a crosslinking agent and (B) 5 to 95% by weight of a cyanate ester thermosetting resin composition.

3. In a method for producing a laminate which comprises consolidating a plurality of layers under heat and pressure, at least one of said layers being a prepreg sheet which is a sheet of a crosslinkable resin composition or a composite sheet obtained by bonding said sheet of said crosslinkable resin composition to a substrate, the improvement wherein said crosslinkable resin composition is a crosslinkable resin composition of claim **1**.



4,287,015

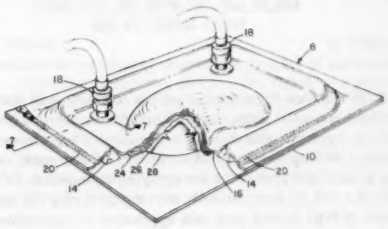
VACUUM BAG USED IN MAKING LAMINATED PRODUCTS

Harold J. Danner, Jr., 2455 F St. S.E., Apt. 106, Auburn, Wash. 98002

Filed Oct. 18, 1976, Ser. No. 733,107

Int. Cl.³ B32B *31/20*

U.S. Cl. 156—382 **5 Claims**



1. A vacuum bag like assembly used in making laminated products in which laminates are adhesively secured together, comprising:

(a) an air tight base plate on which laminations with their applied adhesives are placed;

(b) an air tight upstanding ribbing structure continuously affixed to the air tight base plate and well spaced inwardly from the perimeter of the air tight base plate to surround laminations with their applied adhesives;

(c) a stretchable air tight vacuum bag membrane to be laid across laminations with their applied adhesives and to be extended beyond to completely contact the continuous full length of the air tight upstanding ribbing structure and to be held securely at selected locations along the perimeter of the air tight base plate, while being well stretched into continuous firm air sealing contact with the air tight upstanding ribbing structure, thereby completing a vacuum bag like assembly;

(d) fastening means to secure the stretchable air tight vacuum bag membrane to the air tight base plate along selected portions of the perimeter; and

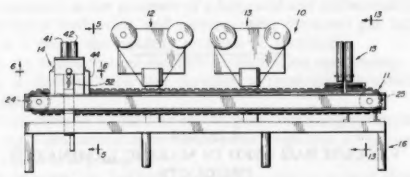
(e) vacuum means secured in part to the vacuum bag like assembly, whereby a vacuum may be drawn within the vacuum volume determined by the air tight base, the continuous air tight upstanding ribbing structure, and the stretchable air tight vacuum bag membrane, in respect to the continuous air tight seal created along the top of the air tight upstanding ribbing structure.

4,287,016

MACHINE FOR APPLYING INDICIA TO TENNIS BALL FELTS

Daniel Kerwin, Lombard, and Victor Trentadue, Arlington Heights, both of Ill., assignors to The Meyercord Co., Carol Stream, Ill.

Filed Jul. 18, 1978, Ser. No. 925,812
Int. Cl.[3] B65C 9/02; B65H 3/08, 3/34
U.S. Cl. 156—497 8 Claims



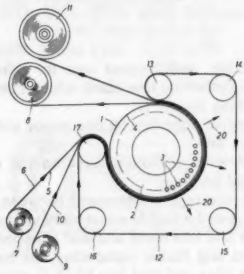
1. A machine for applying indicia to tennis ball felts while the felts are in flat form, each of said felts including a fuzzy side and an opposite side having a mastic coating thereon, said coating tending to adhere adjacent felts of said stack, comprising at least one applicator for applying an indicium to a fuzzy side of a felt, an intermittently moving conveyor for moving a series of felts to and past said applicator in intermittent start and stop movement, a destacking mechanism adjacent one end of said conveyor including a magazine adapted to receive and support said stack of felts, a movable head mounted at the lower open end of the stack, said head including a flat surface and air means for holding a felt on said flat surface, means for moving said head generally vertically between an upper position where said flat surface engages the lower side of the lowermost felt of said stack and supports said stack and said air means attaching said lowermost felt to said head, and a lower position where said head is spaced downwardly from said stack and places said felts on said conveyor during a stop portion of said movement, blade means movably mounted between said head and said stack, means for moving said blade through said stack to separate said lowermost felt from the remainder of said stack and then to retract said blade, said blade further supporting said stack when said head is not in said upper position, said air means producing a partial vacuum to hold a felt while said blade is moving through said stack and while said head is moving from said upper position to said lower position, a restacking mechanism adjacent the other end of said conveyor for removing said felts from said conveyor and restacking said felts during a stop portion of said movement, and means on said conveyor for holding said series of felts at regularly spaced positions during said intermittent movement, said holding means being oriented with said destacking and restacking mechanisms and with said applicator whereby respective holding means are simultaneously adjacent said destacking and restacking mechanisms and said applicator, and said mechanisms and said applicator operating simultaneously during said stop portions of said movement.

4,287,017

ENDLESS PRESSING-ON AND GUIDING BELT FOR TEXTILE TREATING DEVICES, ESPECIALLY TRANSFER PRINTING MACHINES AND STEAMING CALENDERS

Karl-Peter Lopata, Krefeld, and Wolfgang Tschirner, Tönisvorst, both of Fed. Rep. of Germany, assignors to Kleinewefers GmbH, Krefeld, Fed. Rep. of Germany

Continuation of Ser. No. 908,272, May 22, 1978, abandoned. This application Nov. 5, 1979, Ser. No. 91,501
Claims priority, application Fed. Rep. of Germany, May 21, 1977, 2723085
Int. Cl.[3] B30B 5/04, 15/34
U.S. Cl. 156—583.5 10 Claims



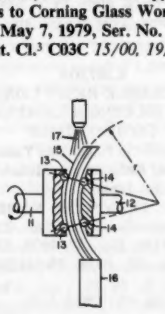
1. In a transfer printing machine which comprises a rotary drum, means for heating said drum and two webs passing together about said drum, the first web of fabric to be printed and the second web carrying material for printing on said first web, and means for heating said drum, an endless belt passing about said two webs and drum and pressing said webs against said drum as said drum rotates, said endless belt being formed of a woven fabric having a warp consisting exclusively of solid bronze threads extending longitudinally of said belt and a weft consisting exclusively of solid metal wires of nickel-alloy.

4,287,018

METHOD FOR FINISHING GLASS-PLASTIC LAMINATED LENS BLANKS

Suresh T. Gulati, Elmira, and Anton A. Spycher, Big Flats, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 7, 1979, Ser. No. 36,607
Int. Cl.[3] C03C 15/00, 19/00
U.S. Cl. 156—645 6 Claims



2. A method for edge-finishing a glass-plastic laminated lens blank comprising a relatively thin, compressively stressed sheet glass core element positioned between and adhesively bonded to two relatively thick, tensilely stressed plastic surface layer elements which comprises the steps of:

(a) heating the laminated lens blank to an elevated temperature sufficient to at least partly relieve bond stress present in the glass core element and plastic surface layers;

(b) grinding material from the edge of the laminated lens blank to achieve a selected finished edge configuration while maintaining the lens blank at said elevated temperature; and

(c) exposing the edge of the glass core element to a glass etching medium for a time at least sufficient to essentially completely eliminate surface flaws present thereon.

4,287,019

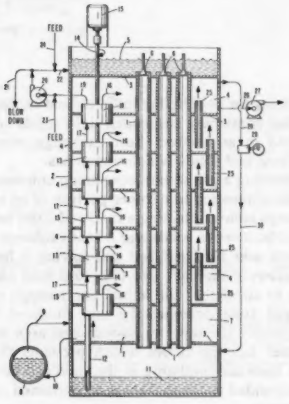
APPARATUS AND METHOD FOR ADIABATIC FLASHING OF LIQUIDS

Ferris C. Standiford, 2713 S. North Bluff Rd., Greenbank, Wash. 98253

Continuation-in-part of Ser. No. 612,736, Sep. 12, 1975, abandoned. This application Sep. 26, 1980, Ser. No. 191,446

Int. Cl.³ B01D *1/06*

U.S. Cl. 159—2 MS **9 Claims**



1. In a system adapted to purify impure liquid in a multistage flash evaporator by the sequential heating and flashing thereof, the combination of:

(a) a vertically disposed vessel having a series of horizontal partitions to provide a series of superposed condensing spaces therein, and provided with an upper impure liquid sump chamber and lower sump chamber;

(b) a vertical indirect contact heating surface in said condensing spaces and interconnecting said upper impure liquid chamber with said lower sump chamber whereby impure liquid will be heated and in being heated will condense vapor at successively higher pressures in each successively lower of said condensing spaces as said impure liquid passes downwardly over said heating surface;

(c) a series of vertically superposed coaxial flash chamber means, each possessing successive lower pressure as a result of the flashing of liquid therein to form both a vapor and liquid stream, wherein said vapor stream is passed to said vertical indirect heating surface to raise the temperature of said downwardly passing impure liquid and each one of said flash chamber means being sealed to one of said partitions and including centrifugal means to force liquid toward the periphery of said flash chamber means and to collect vapor near the axis thereof;

(d) a conduit in association with each of said flash chamber means to conduct impure liquid from said liquid sump to the lowermost and then sequentially to the uppermost of said flash chamber means;

(e) means to conduct said vapor from near the axis of each of said flash chamber means to the condensing space laterally adjacent thereto, wherein said vapors are condensed to liquid;

(f) means to remove said condensed vapor as a purified liquid condensate; and

(g) means to supply heat from an external source to said impure liquid, either in the lowermost of said superposed condensing spaces or as the liquid is transferred from said liquid sump to the lowermost of said flash chamber means, whereby said system represents a liquid purification system wherein successive pressure reduction is effected by sequential heating and flashing of said liquids.

4. A flash device for use in multistage flash evaporator systems utilizing a flash tower provided with at least one vapor condensing space therein formed by lateral partitions within said tower, said flash device comprising:

(a) a cylindrical, stationary vessel having an inlet line into the bottom thereof for liquid to be flashed;

(b) an impeller provided with impeller blades within said vessel having means for rotation thereof at a speed to force said liquid to the outer wall to thereby form a vapor-liquid interface;

(c) a skimmer plate near the top of said vessel of a diameter less than the inside diameter of said vessel to permit escape of liquid only therethrough;

(d) a vapor outlet near the axis of rotation of said impeller, said outlet being adapted to lead into said condensing space; and

(e) means for sealing said vessel to one of said partitions.

4,287,020

METHOD OF PREPARATION OF AN ASBESTOS PRODUCT

Irving F. Moore, P.O. Box 805, Coalinga, Calif. 93210

Filed Nov. 29, 1979, Ser. No. 98,893

Int. Cl.³ C03B *37/00*

U.S. Cl. 162—3 **16 Claims**

1. A method for producing an asbestos product of increased strength comprising subjecting asbestos ore flakes comprised of a flexible mat of randomly oriented and interwoven chrysotile asbestos fibers to a flattening and spreading out operation for a time sufficient to flatten and spread out said flakes so as to open said fibers but for a time insufficient to effect separation of said flakes into individual asbestos fibers and reduction in the natural length of said fibers.

4,287,021

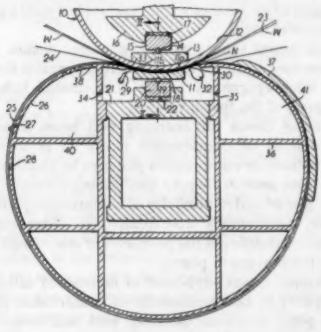
EXTENDED NIP PRESS

Edgar J. Justus, and Arnold J. Roerig, both of Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed Aug. 27, 1979, Ser. No. 69,869

Int. Cl.³ D21F *3/06, 3/08*

U.S. Cl. 162—358 **7 Claims**



1. An extended nip press for removing water from a traveling web in a paper machine comprising in combination:

a press roll;

an elongate shoe forming a press nip with said press roll and

having a concave surface to conform to said roll so that the press nip is formed elongate in the direction of web travel through the nip;

a first endless felt trained over said roll to travel through said nip;

an endless belt trained over said shoe for passing through said nip;

a second endless felt trained over said belt to travel through said nip with the web passing through the nip between said felts;

means for providing a lubricant between said shoe and belt;

and guide means within said belt guiding and supporting the belt on the shoe;

said guide means having an outer smooth curved surface of a circumference slightly smaller than the belt to provide a continual smooth sliding surface for the belt so that the belt operates under zero tension and is self-aligning wherein the belt is guided substantially along the entire circumference of the guide means.

4,287,022

COMPRESSION HUB FOR A FUSION REACTOR SYSTEM

Scott R. Penfield, Jr., Carlsbad, Calif., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 2, 1979, Ser. No. 47
Int. Cl.³ G21B *1/00*
U.S. Cl. 176—3 **10 Claims**

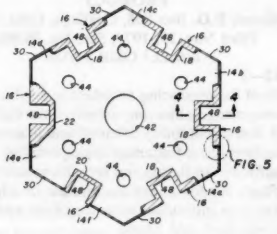


FIG. 5

1. A compression hub, operable for use in resisting the forces tending to draw the magnets of a fusion reactor together towards a common point comprising:

a. a multiplicity of compression plates, each of said multiplicity of compression plates having rabbet means formed in at least some of the side walls thereof, said multiplicity of compression plates being arranged in stacked relation relative to each other so that said rabbet means are aligned in parallel rows;

b. beam means supported in said rabbet means, said beam means having means formed therein operable for effecting the interengagement of the compression hub with the magnets of the fusion reactor;

c. securing means for fastening said beam means to said multiplicity of compression plates so as to cause said multiplicity of compression plates to be physically spaced one from another thereby establishing between each adjacent pair of said multiplicity of compression plates an open space, substantially co-extensive in dimensions to the dimensions defining the perimeter of one of said multiplicity of compression plates;

d. seal plate means supported in juxtaposed relation to the periphery of said multiplicity of compression plates, said seal plate means cooperating with said beam means to form a closed, fluid tight structure of the compression hub; and

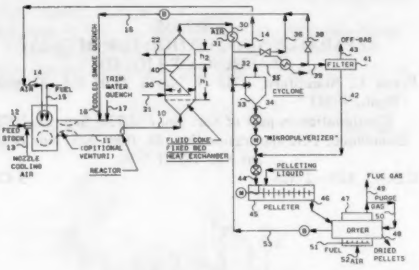
e. fluid flow means embodied in the compression hub, said fluid flow means being operable to provide a fluid flow path for coolant through the compression hub.

4,287,023

WASTE HEAT RECOVERY

William T. Cooper, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.

Filed Aug. 23, 1979, Ser. No. 69,153
Int. Cl.³ C10B *3/02*
U.S. Cl. 201—31 **9 Claims**



1. A process for conducting indirect heat exchange between a gas stream containing suspended light solids and a heat exchange fluid in an indirect heat exchange zone containing fluidized fixed bed solids which comprises:

(a) introducing a gas stream containing entrained solids into an inlet connected to a lower portion of an enlarged heat exchange zone containing a fluidized fixed bed of particulate carbonaceous solids and a heat exchange coil extending into said fluidized bed and having a heat exchange fluid flowing through said coil, said heat exchange zone being so sized that the actual gas passage space in said enlarged zone occupied by said fluidized fixed bed is substantially the same cross-sectional area as that of the gas inlet and gas outlet which prevents the suspended solids from accumulating in the fluidized bed and allows the suspended solids to flow in an entrained manner in the gas stream,

(b) flowing said gas stream through said fluidized bed of particulate carbonaceous solids at a flow rate sufficient to maintain fluidized conditions and at a rate such that said gas is heated or cooled by the heat exchange fluid in said coil,

(c) removing said gas stream containing suspended solids at a different temperature from an upper portion of said heat exchange zone,

(d) passing said gas stream containing suspended solids to a gas-solids separation zone to separate suspended solids therefrom and recover cooled gas substantially reduced in suspended solids content, and

(e) quenching said gas stream containing entrained solids prior to step (a) with water and at least a portion of said cooled gas recovered in (d).

4,287,024

HIGH-SPEED SMOKELESS COKE OVEN BATTERY

Buster R. Thompson, Rte. No. 1, Lowes Ferry Pike, Louisville, Tenn. 37777

Filed Jun. 22, 1978, Ser. No. 918,054
Int. Cl.³ C10B *5/08, 29/08*
U.S. Cl. 202—134 **36 Claims**

1. A battery of nonrecovery coke ovens comprising,

means defining a plurality of elongated coking chambers constructed in side-by side relation and each including sidewalls, an oven roof supported on said sidewalls, an oven floor for supporting a charge of coal to be coked in the chamber, and removable door means for opening and closing the chamber to permit charging the chamber with coal and discharging coke therefrom,

a system of sole flues extending beneath each said oven floor, said sole flues being defined by refractory walls extending

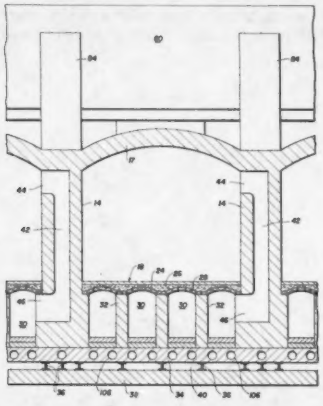
between said oven floor and a base slab spaced beneath the floor,

downcomer means formed in said sidewalls and connecting the upper section of each said coking chamber with the sole flue system extending beneath the floor of the chamber,

elongated substantially horizontal combustion tunnel means extending transversely of said plurality of ovens,

chimney means connecting said sole flue system of each of said plurality of ovens with said combustion tunnel means whereby gases from the sole flue systems of said plurality of ovens are discharged into and combined in said combustion tunnel means,

stack means extending above said ovens and said tunnel means and connected in fluid communication with said tunnel means to provide a draft from the upper section of



each said coking chamber through a continuous flow path defined by said downcomer means, said sole flue systems, said chimney means, and said tunnel means through said stack means to the atmosphere,

charging gas bypass means connected between the top of each said coking chamber and said combustion tunnel means through said roof providing a direct gas flow path from the coking chamber into said combustion tunnel means whereby charging gas may be drawn from the coking chamber directly into the combustion tunnel for mixture with and incineration by the hot gases from the sole flues of other ovens, and

valve means connected in said bypass means, said valve means being operable to selectively open and close said direct gas flow path between the respective coking chambers and the combustion tunnel means.

4,287,025

DEVICE FOR SOLID-STATE PYROLYSIS OF ORGANIC POLYMERIC SUBSTANCES

Bernhard Lersmacher, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 5, 1979, Ser. No. 82,395

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1978, 2843676

Int. Cl.³ C10B *1/04, 27/00, 27/06*

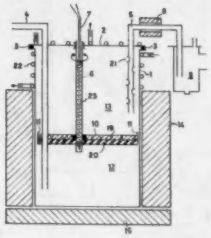
U.S. Cl. 202—222 **13 Claims**

1. A device for converting natural and synthetic organic polymeric substances into carbon bodies by solid state pyrolysis comprising:

(a) a heatable, vertically positioned, elongated reaction vessel suitable for containing the polymeric substance to be pyrolyzed;

(b) cover means for providing a gas-tight seal for said reaction vessel;

(c) at least one solid collecting wall **(10)** positioned horizontally within said reaction vessel above the polymeric substance to be pyrolized, said collecting wall serving to divide said reaction vessel into a lower portion **(12)** containing the polymeric substance and an upper portion **13** wherein volatile decomposition products formed by pyrolysis of said polymeric substance are condensable on the upper surface of said collecting wall **(10)**, said collecting wall **(10)** being so positioned as to leave a passage for gases between the lower and the upper portions of said reaction vessel;



(d) an outlet **(5)** extending from the upper portion **(13)** of said reaction vessel for conducting decomposition products formed by pyrolysis of said polymeric substance away from said reaction vessel;

(e) a purging gas inlet **(4)** extending through said reaction vessel into said lower portion **(12)** for introducing a gas into said lower portion **(12)** of said reaction vessel; and

a (f) heating device arranged around said reaction vessel in a manner such that said lower portion **(12)** containing the polymeric substance is heatable under a quasi-isothermal condition with temperatures suitable for causing pyrolysis of the polymeric substance and only a section of said upper portion **(13)** extendingly upwardly in a vertical direction away from said collecting wall is heatable **(10)**.

4,287,026

DESALINIZATION METHOD

William A. Wallace, 5515 N. Sagugaro, Paradise Valley, Ariz. 85253

Filed Mar. 29, 1979, Ser. No. 25,097

Int. Cl.³ B01D *3/00*

U.S. Cl. 203—10 **5 Claims**

1. A method for removing dissolved salt and other minerals from water, comprising the steps of:

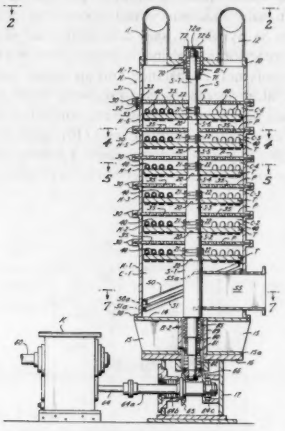
introducing water having dissolved salt and other minerals therewith into a housing;

flowing the water having dissolved salt and other minerals therewith through a series of stages formed of a series of rotatable trays alternately separated by a series of fixed stop plates in the housing;

heating the water in each successive tray and stop plate stage to effect the vaporization of the water to produce water vapor having at least some of the dissolved salt and other minerals separated from and suspended in the water vapor, substantially solely by rotating the trays at a sufficiently high velocity;

swirling the water vapor, salt and minerals to exert a centrifugal force on the water vapor and the salt and minerals to

physically separate the salt and minerals from the water vapor within the housing; and,



thereafter removing the separated salt and minerals from the housing apart from the water vapor.

4,287,027

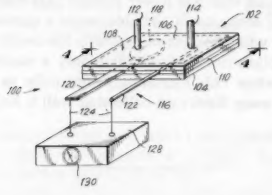
METHOD OF DETERMINING THE CONCENTRATION OF REDUCING AGENTS

Jeffrey M. Tosk, 3235 Cambridge Ave., Bronx, N.Y. 10463

Filed May 20, 1980, Ser. No. 151,687

Int. Cl.³ G01N *27/30, 27/52*

U.S. Cl. 204—1 T **8 Claims**



1. A method for determining the concentration of a reducing agent in a fluid, which is capable of reducing platinum oxide to platinum, comprising the steps of fabricating an active electrode from a mixture of platinum and platinum oxide constructed and arranged to retain its structural integrity during use, placing said active electrode proximate to a counter-electrode, bringing said electrodes in contact with said reducing agent in said fluid, and measuring the electrode potential created from an oxidation-reduction reaction occurring between said electrodes and said reducing agent.

4,287,028

ELECTROCHEMICAL DETECTION PROCEDURE FOR THE DETERMINATION OF GLUCOSE IN BIOLOGICAL FLUIDS

Karl G. Blass, 148 Cardinal Crescent, Regina, Saskatchewan, Canada

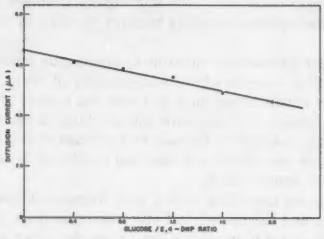
Filed Jun. 6, 1980, Ser. No. 157,207

Claims priority, application United Kingdom, Jun. 13, 1979, 20637/79

Int. Cl.³ G01N *27/52*

U.S. Cl. 204—1 T **1 Claim**

1. An electrochemical process to determine the concentration of glucose in serum samples, other fluids or solids brought into solution, whereby glucose is reacted with an aromatic reagent containing one or more nitro groups, and the chemical



reaction is monitored at electrodes which measure the current produced by the reaction of one or more of the nitro groups.

4,287,029

PLATING PROCESS

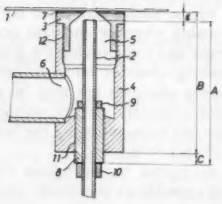
Kouichi Shimamura, Yokohama, Japan, assignor to Sonix Limited, Kanagawa, Japan

Filed Mar. 24, 1980, Ser. No. 133,130

Claims priority, application Japan, Aug. 9, 1979, 54-100772

Int. Cl.³ C25D *5/02, 5/08*

U.S. Cl. 204—15 **11 Claims**



1. A process of continuously electroplating of an elongated electroconductive sheet, comprising the steps of enclosing a smaller work surface of the sheet with a mask thereby defining a closed space within said mask and to determine a plating shape and pattern to be produced; introducing an outer air by air induction means having no influence upon the surface of the sheet to be treated to obtain an air curtain within said mask; disposing a nozzle within said closed space; jetting a plating solution through said nozzle to said work surface while supplying electric power to different polarity to said nozzle and said work surface and simultaneously suctioning to and discharging fluid from said closed space; plating the jetted plating solution on said work surface; and discharging said plating solution together with atmosphere from in said closed space by suctioning said solution from said mask, whereby said air-introducing step speeds up said discharging step and prevents said plating solution from permeating outside said mask.

4,287,030

PROCESS FOR PRODUCING HIGH-PURITY INDIUM

Arkady A. Belsky, Komsomolsky prospekt, 48/22, kv. 20; Alexandr V. Eljutin, 3 Frunzenskaya ulitsa, 7, kv. 176, both of Moscow; Valery N. Zubkov, ulitsa V. Dubinina, 6/29, kv. 16, Podolsk Moskovskoi oblasti; Alexandr I. Konjukov, Bolshaya Akademicheskaya ulitsa, 39 "V", kv. 37, Moscow; Lidia I. Krasinskaya, Otkrytoe shosse, 17, korpus 8, kv. 155, Moscow; Elena A. Nekrasova, Novye Cheremushki, kvartal 32-a, korpus 10, kv. 14, Moscow; Konstantin S. Nizharadze, ulitsa Dorozhnaya, 20, korpus 1, kv. 72, Moscow; Larisa F. Markova, ulitsa Shkolnaya, 12, kv. 3, Vidnoe Moskovskoi oblasti; Mirra G. Mirskaya, ulitsa Bolshaya Cherkizovskaya, 9, korpus 1, kv. 171, Moscow; Alexei V. Frolov, ploschad Pobedy, 2, korpus 2, kv. 176, Moscow, and Evgeny A. Judin, ulitsa Medikov, 29, korpus 3, kv. 16, Moscow, all of U.S.S.R.

Filed May 19, 1980, Ser. No. 150,949
Int. Cl.[3] C25C *1/22*
U.S. Cl. 204—105 R 2 Claims

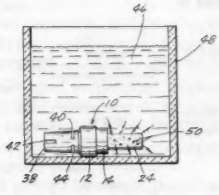
1. A process for producing high-purity indium comprising vacuum melting of the metal in two stages: in the first stage at a temperature ranging from 850° to 940° C. for a period of from 1 to 5 hours; in the second stage at a temperature ranging from 950° to 1,100° C. for 0.5–2 hours, followed by electrochemically refining the metal in a hydrochloric acid solution and remelting of the residue of indium evolved on the cathode by introducing into molten indium at a temperature of from 160° to 400° C.

4,287,031

PORTABLE ELECTROLYSIS UNIT FOR RECOVERY OF PRECIOUS METALS

David L. Good, 3708 Hickman, Des Moines, Iowa 50310, and Dallis L. Good, P.O. Box 1354, Middlesboro, Ky. 40965

Filed May 5, 1980, Ser. No. 146,298
Int. Cl.[3] C25C *1/20, 7/00;* C25B *11/04*
U.S. Cl. 204—109 7 Claims



7. A method for recovering silver from a waste material solution containing silver ions, said method comprising:

placing a small receptacle in said waste solution, said receptacle having a top closure portion and a bottom closure portion which can be sealingly joined to define an interior cavity, a direct current battery cell having positive and negative terminals resting in said interior cavity, a cathode plate in electrical contact with the negative terminal of said battery and extending through said bottom closure and being in contact with said solution, and an anode in electrical contact with the positive terminal of said battery and extending through said top closure so as to be in contact with said solution;

leaving said receptacle in said solution long enough for silver to collect on said cathode by electrolysis;

removing said receptacle from said solution; and

removing said silver from said cathode.

4,287,032

PROCESS FOR GENERATING A HALOGEN WITH NOVEL ELECTRODES

Alberto Pellegri, Luino, Italy, assignor to Oronzio deNora Impianti Elettrochimici S.p.A., Milan, Italy

Filed Feb. 14, 1980, Ser. No. 121,414
Claims priority, application Italy, Aug. 1, 1979, 24829 A/79
Int. Cl.[3] C25B *1/24, 11/04, 11/08, 11/10*
U.S. Cl. 204—128 17 Claims

1. An electrode comprising a pulverulent electroconductive, electrocatalytic material bonded together with a fluoroolefin polymer having a hydrophilic surface.

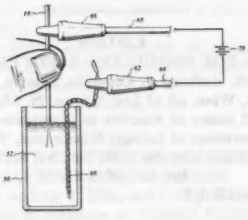
17. A method of generating a halogen comprising electrolyzing an aqueous halide solution in electrolysis cell containing at least one anode and one cathode separated by an ion-permeable membrane in sheet form having an electrode of claim 1 as the anode bonded to one side thereof in layer form, circulating an anolyte and a catholyte through the respective chambers, applying an electrolysis voltage between the anode and the cathode and recovering electrolysis products from said respective chambers, the hydrophilic surface being obtained by exposing the polymer to ionizing radiation from a Cobalt 60 source with a radiation dose from 10 to 400 Megarads in the presence of a precursor substance of hydrophilic groups.

4,287,033

ELECTROCHEMICAL METHOD FOR REMOVING METALLIC SHEATHS

James A. Weibel, Sr., Tonawanda, and Franklin A. Vassallo, Lancaster, both of N.Y., assignors to Calspan Corporation, Columbus, Ind.

Filed Apr. 14, 1980, Ser. No. 139,905
Int. Cl.[3] C25F *5/00, 3/14*
U.S. Cl. 204—146 2 Claims



1. A method for selectively removing a metallic sheath from an electrically insulated core while leaving the core unaffected and including the steps of:

connecting a suitable cathode to a source of power and inserting the cathode into an acid mixture;

connecting a metal sheath of an element as an anode and connecting the anode to the source of power; and

inserting the sheath into the acid mixture to a depth corresponding to the amount of sheath to be removed whereby an electrical circuit is completed and the immersed portion of the sheath is electrochemically removed.

4,287,034

PROTECTING METAL SUBSTRATES FROM CORROSION

George Pieslak, Alameda; Kathleen A. Erbes-Mrsny, and Elena C. Fritchle, both of San Bruno, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Nov. 9, 1979, Ser. No. 92,852
Int. Cl.[3] C23F *13/00;* D03D *49/24;* C08L *1/00;* C08K *5/05*
U.S. Cl. 204—147 72 Claims

1. An article of a heat shrinkable material having coated on at least a part of the surface thereof an adhesive composition comprising an adhesive component and an aliphatic polyhy-

droxy compound in which hydroxyl groups are bonded to at least 50 percent of the aliphatic carbon atoms in an amount sufficient to impart improved resistance to cathodic disbondment to the adhesive composition, said adhesive component being a hot melt adhesive or a mastic.

16. A pipe having bonded to the surface thereof a polymeric coating, said coating being bonded to said pipe with an adhesive composition comprising an adhesive component and from about 0.01 to about 30 percent by weight, based on the total weight of the adhesive composition, of an aliphatic polyhydroxy compound in which hydroxyl groups are bonded to at least 50 percent of the aliphatic carbon atoms, said adhesive component being a hot melt adhesive or a mastic.

28. A metal pipe which is connected in an electric circuit such that said pipe forms a cathode; said pipe having bonded to the surface thereof a polymeric coating with an intermediate layer of an adhesive comprising an adhesive component and from about 0.01 to about 30 percent by weight, based on the total weight of the composition of an aliphatic polyhydroxy compound in which hydroxyl groups are bonded to at least 50 percent of the carbon atoms, said adhesive component being a hot melt adhesive or a mastic.

40. An adhesive composition comprising an ethylene-ethyl acrylate copolymer hot melt adhesive and from about 0.01 to about 30 percent by weight, based on the total weight of the adhesive composition, of an aliphatic polyhydroxy compound in which hydroxyl groups are bonded to at least 50 percent of the aliphatic carbon atoms.

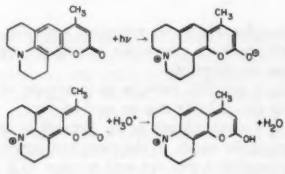
52. A method of improving the resistance to cathodic disbondment of an adhesive which comprises incorporating into a hot melt adhesive or a mastic from about 0.01 to about 30 percent by weight, based on the total weight of the adhesive composition, of an aliphatic polyhydroxy compound in which hydroxyl groups are bonded to at least 50 percent of the aliphatic carbon atoms.

4,287,035

METHOD FOR PRODUCING RAPID PH CHANGES

John H. Clark; Anthony J. Campillo; Stanley L. Shapiro, and Kenneth R. Winn, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 24, 1979, Ser. No. 42,163
Int. Cl.³ B01J *19/12*
U.S. Cl. 204—157.1 R **3 Claims**



3. A method of rapidly initiating an acid or base catalyzed reaction which comprises:

(a) forming a solution of (i) the reactants which undergo said reactions, and (ii) a compound which is substantially nonreactive with said reactants in either its ground state or its excited state and which on electronic excitation exhibits a substantial pK change in the direction required to initiate said reaction,

(b) adjusting the pH of said solution to be near but not at that at which said reaction occurs, and

(c) irradiating said solution with electromagnetic radiation having an appropriate frequency and an intensity sufficient to produce a concentration of excited species from said compound at which the pH of said solution is changed sufficiently to initiate said reaction.

4,287,036

METHOD FOR PRODUCING A REDUCTION PRODUCT USING A PHOTO-REGENERATED TRANSITION METAL CATALYST

Minoru Tsutsui, Bryan, Tex., and Yoshiharu Doi, Tokyo, Japan, assignors to Texas A & M University, College Station, Tex.

Filed May 8, 1980, Ser. No. 148,015
Int. Cl.³ B01J *19/12*
U.S. Cl. 204—157.1 R **16 Claims**

1. A catalytic method of producing a reduction product in solution at ambient temperature and pressure by using a reducing agent which is simultaneously photo-regenerated to its active reducing state following its consumption in the reduction, comprising the steps of:

(a) obtaining a solution of a transition metal alcoholate complex comprising an alcohol, a transition metal salt, and a base;

(b) contacting with said solution a starting chemical selected from the group consisting of molecular nitrogen, oxides of nitrogen, hydrazine, and aliphatic substituted hydrazines; and

(c) while maintaining said contact, irradiating said solution with radiation of sufficient intensity and duration to produce the desired product, wherein said radiation is selected at the charge-transfer band of the transition metal alcoholate complex by reference to the absorption, emission and excitation spectra of said metal alcoholate complex solution so as to

(i) maximize the absorption of said radiation;

(ii) maximize the vibrational degradation process, resulting in fluorescence; and

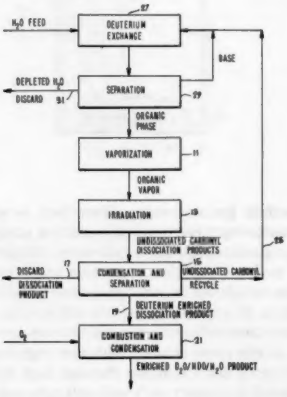
(iii) minimize the dissociation of said complex.

4,287,037

DEUTERIUM ENRICHMENT BY SELECTIVE PHOTO-INDUCED DISSOCIATION OF AN ORGANIC CARBONYL COMPOUND

John B. Marling, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 4, 1978, Ser. No. 893,233
Int. Cl.³ B01J *19/12*
U.S. Cl. 204—158 R **13 Claims**



1. A method for producing a deuterium enriched material by selective photo-induced dissociation which comprises:

providing a gas phase photolytically dissociable organic carbonyl compound containing at least one hydrogen atom bonded to an atom which is adjacent to a carbonyl group and consisting of molecules wherein said hydrogen

atom is present as deuterium and molecules wherein said hydrogen atom is present as another isotope of hydrogen;

subjecting the gas phase organic carbonyl compound to infrared radiation at a preselected wavelength and of sufficient intensity to selectively excite and induce dissociation of said deuterium containing molecules, thereby providing a deuterium enriched molecular dissociation product, the non-excited molecules remaining substantially undissociated; and

recovering the deuterium enriched molecular dissociation product.

4,287,038

PURIFICATION OF CHLOROPHENOLIC DERIVED COMPOUNDS

Edward M. Geiser, Downers Grove, and Russell W. Johnson, Villa Park, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed May 8, 1980, Ser. No. 147,981

Int. Cl.³ B01J *19/12*

U.S. Cl. 204—158 R **10 Claims**

1. A process for the removal of a contaminant comprising 2,3,-7,8-tetrachlorodibenzo-p-dioxin from a chlorophenolic derived compound which comprises subjecting a solution of said compound dissolved in a protic solvent to the emission from a light source having a wave length in the range of from about 180 to about 350 nanometers, and recovering the purified chlorophenolic derived compound.

4,287,039

RADIATION-CURABLE AQUEOUS BINDER DISPERSIONS, THEIR PREPARATION AND THEIR USE

Ingolf Buethe, Mannheim, and Werner Loch, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 26, 1979, Ser. No. 97,747

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1978, 2853921

Int. Cl.³ C08L *67/06*

U.S. Cl. 204—159.19 **7 Claims**

1. A radiation-curable aqueous binder dispersion, which essentially comprises

(A) from 20 to 80 percent by weight of water,

(B) from 80 to 20 percent by weight of one or more prepolymers which are dispersed in (A) and contain from 0.01 to 1.0 mole, per 100 g of prepolymer, of polymerizable carbon-carbon double bonds and have a mean molecular weight of not less than 350 and a viscosity, at 23° C., of not less than 600 cp, the sum of the percentages of (A) and (B) being 100, together with

(C) from 3 to 12 percent by weight, based on (B), of one or more dispersants, selected from the group consisting of polyvinylpyrrolidone and a copolymer of vinylpropionate or vinylacetate with vinylpyrrolidone, and

(D) from 0 to 20 percent by weight, based on (B), of one or more photoinitiators.

4,287,040

PRODUCTION OF NITRIC OXIDES

Moshe Alamaro, Hod-Hasharon, Israel, assignor to G.D. Societa per Azioni, Bologna, Italy

Filed Apr. 28, 1980, Ser. No. 144,042

Claims priority, application Israel, May 8, 1979, 57239

Int. Cl.³ C01B *21/30, 21/32*

U.S. Cl. 204—179 **10 Claims**

1. A process for the production of nitric oxides which comprises establishing an electrical discharge, passing through such discharge a mixture consisting essentially of air and a seeding amount of nitric oxide as seeding material, and recovering the produced nitric oxides.

4,287,041

PROCESS FOR ELECTRODEPOSITION OF CATIONIC RESINS

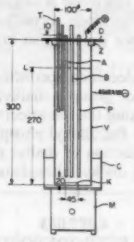
Akira Tominaga, and Reijiro Nishida, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Japan

Division of Ser. No. 78,909, Sep. 25, 1979. This application Apr. 14, 1980, Ser. No. 142,167

Claims priority, application Japan, Dec. 29, 1978, 53-162280

Int. Cl.³ C25D *13/06*

U.S. Cl. 204—181 C **2 Claims**



1. In a method of electrodeposition coating of an electrically conductive surface serving as a cathode which comprises passing an electric current across said cathode and an anode in contact with an aqueous electrodepositable composition; the improvement wherein said electrodepositable composition consists essentially of

(i) as a film-forming ingredient, the reaction product of (A) an epoxy resin, or an adduct of an epoxy resin with a primary amine and/or a secondary amine, (B) an amino-terminated condensation product between a maleinized fatty acid and a polyamine, and (C) a partially blocked polyisocyanate,

(ii) a water-soluble aqueous inorganic or organic acid as a neutralization agent for said reaction product (i), and

(iii) an aqueous medium.

4,287,042

ION-SELECTIVE ELECTRODE AND METHOD OF MAKING SAID ELECTRODE

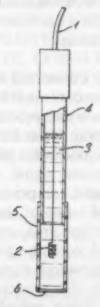
Leslie C. Ebdon; Andrew T. Ellis, and George C. Corfield, all of Sheffield, England, assignors to National Research Development, Corp., London, England

Filed Mar. 6, 1980, Ser. No. 127,749

Claims priority, application United Kingdom, Mar. 9, 1979, 08452/79

Int. Cl.³ G01N *27/30*

U.S. Cl. 204—195 M **26 Claims**



1. An ion-selective electrode comprising a standard solution of the ion and, retaining the solution, a membrane comprising

an unsaturated organic polymer having sensor groups covalently bonded to said polymer, characterized in that the unsaturated organic polymer is cross-linked at least in part through a covalently-bonded sensor group of the formula

where A and B are unsaturated moieties cross-linking the polymer, whereby the electrode is calcium-selective.

8. An ion-selective electrode according to claim **1**, characterised in that the sensor group is an organophosphate or an organophosphonate.

9. An ion-selective electrode according to claim **8**, characterised in that the sensor group is dialkyl phosphate.

10. A method of making the ion-selective electrode of claim **9**, characterised in that the dialkyl phosphate is made directly from a cross-linking reaction of diallyl phosphoric acid with the membrane yielding dialkyl phosphate.

4,287,043

APPARATUS FOR ELECTRODEPOSITING A METALLIC LAYER OF PREDETERMINED THICKNESS

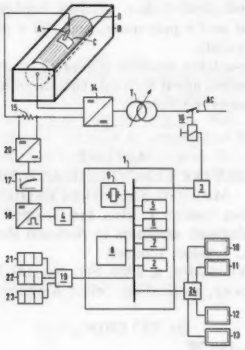
Werner Eckert, and Wolfgang Simon, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 13, 1980, Ser. No. 121,042

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1979, 2936247

Int. Cl.[3] **C25D** *21/12, 17/00*

U.S. Cl. 204—228 **4 Claims**



1. An apparatus for electrodepositing a metallic layer of predetermined thickness on a correction area of an article in a metal salt solution comprising:

a sacrificial anode;

a source of DC voltage connected to the anode;

means for measuring the current flowing from the DC voltage source to the anode and providing a current measurement signal representing mean current values;

a computer having an anode index parameter, an area factor, the current measurement signal, and the predetermined thickness as inputs, and comprising means for cyclically calculating the actual value of thickness of the layer deposited on the correction area, comparing the calculated thickness so obtained with the predetermined thickness, and generating a disconnect signal when the calculated thickness is equal to the predetermined thickness, the deposited thickness being calculated according to the relationship

$$d(t)=(b\text{-}a)/AEG\cdot Q(t)\cdot 1/k$$

where:

d(t) is the actual thickness,

(b-a)/AEG is the anode index derived from the current yield factor b, the anode area a, and the deposition equivalent AEG,

Q(t) is the total charge summed from successive mean values of anode current,

k is the area factor; and

means for disconnecting the anode from the source of DC voltage in response to the disconnect signal.

4,287,044

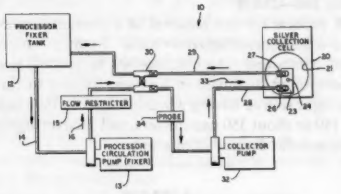
SILVER RECOVERY APPARATUS

Don L. Biles, Chamblee, and A. Alan Richardson, Lilburn, both of Ga., assignors to Silver Systems, Ltd., Chamblee, Ga.

Filed Mar. 31, 1980, Ser. No. 135,674

Int. Cl.[3] **C25C** *7/06, 1/20*

U.S. Cl. 204—231 **5 Claims**



1. An apparatus for recovering a particular ion from a solution containing a plurality of ions of differing decomposition potential, said particular ion having the lowest decomposition potential of said plurality of ions, comprising:

a recovery cell having a positive electrode and a negative electrode;

a receptacle containing said solution;

liquid conduit means connecting said receptacle and said cell;

probe means in contact with said solution in said liquid conduit means for providing a signal in response to presence of said particular ion in said solution adjacent to the one of said electrodes of opposite polarity to said particular ion;

magnetic drive pump means located between said probe means and said cell for pumping said solution between said receptacle and said cell; and

means for repeatedly driving a plating current through said solution in said cell between said electrodes in response to said signal and terminating said plating current after a discrete period of time, until said probe means again provides said signal.

4,287,045

COOLED ELECTRODE ADAPTED TO CONTACT MOLTEN METAL

Christian Lechevallier; Jacques Cordier, and Martine Antoine, all of Metz, France, assignors to Institut de Recherches de la Sidérurgie Française, Saint-Germain-en- Laye, France

Filed Nov. 13, 1979, Ser. No. 93,710

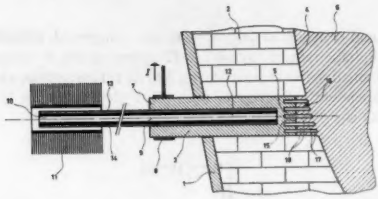
Claims priority, application France, Nov. 10, 1978, 78 32.208

Int. Cl.[3] **C25C** *7/02, 7/00;* **H05B** *7/08*

U.S. Cl. 204—243 R **7 Claims**

1. For use in a metallurgical furnace or the like containing a bath of molten material a combination comprising an electrode embedded over a first portion thereof in the wall of the furnace and having an inner end adapted to be in contact with the molten material and an outer end portion projecting beyond the furnace wall; means for cooling the electrode consisting of a heat pipe including a tubular member extending longitudi-

nally partly through the electrode and having a closed inner end adjacent said inner end of said electrode and an outer end portion projecting beyond that of said electrode and provided with a closed outer end, a capillary structure on an inner surface of said tubular element, and an evaporable heat carrier in



said element and subject to evaporation adjacent said inner end and to condensation adjacent to said outer end, so that a continuous closed heat-syphoning circuit is established; and electrical conductor means connected to the outer end portion of said electrode.

4,287,046

PROCESS FOR TREATING ELECTROLYTIC SOLUTION AND APPARATUS THEREFOR

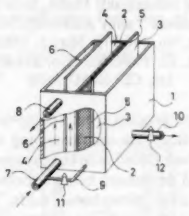
Kenji Ueda, and Akihiro Sakanishi, both of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 62,531, Jul. 3, 1979. This application Feb. 28, 1980, Ser. No. 125,448

Claims priority, application Japan, Aug. 11, 1978, 53/97995; Jun. 8, 1979, 54/72106

Int. Cl.³ C25B *9/00*

U.S. Cl. 204—266 **2 Claims**



2. An apparatus according to claim 1, characterized in that an absorbent layer is sandwiched between said diaphragm and said electrode in said recovery chamber.

4,287,047

Patent Not Issued For This Number

4,287,048

CRACKING PROCESS WITH CATALYST OF COMBINED ZEOLITES

Elroy M. Gladrow, and William E. Winter, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 44,360, May 31, 1979, Pat. No. 4,242,237. This application Mar. 17, 1980, Ser. No. 131,089

Int. Cl.³ C10G *11/05*

U.S. Cl. 208—120 **12 Claims**

1. A catalytic cracking process which comprises contacting a hydrocarbonaceous feed at catalytic cracking conditions in the absence of added hydrogen with a catalyst comprising:

(a) an ultrastable Y-type crystalline aluminosilicate zeolite having less than about 1 weight percent rare earth metals, calculated as the elemental metal, based on the zeolite;

(b) a small pore crystalline aluminosilicate zeolite selected from the group consisting of erionite, mordenite, zeolite A, chabazite and offretite; and

(c) a catalytic inorganic oxide matrix.

4,287,049

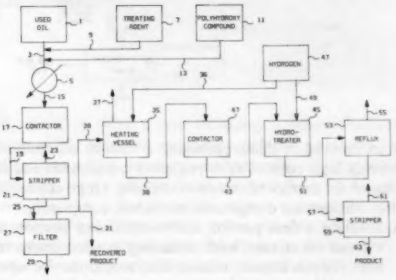
RECLAIMING USED LUBRICATING OILS WITH AMMONIUM SALTS AND POLYHYDROXY COMPOUNDS

Donald C. Tabler, and Marvin M. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartlesville, Okla.

Filed Feb. 5, 1980, Ser. No. 118,702

Int. Cl.³ C10M *11/00*

U.S. Cl. 208—180 **7 Claims**



4. A method for treating used oil comprising:

(a) contacting said used oil with an aqueous solution of an ammonium salt treating agent in the presence of a polyhydroxy compound at conditions of temperature and pressure sufficient for reaction of the treating agent with ash-forming contaminants of the oil thereby producing a precipitate of reacted contaminants,

(b) removing a major portion of water and light hydrocarbon components from the reaction mixture, and

(c) separating an oil phase from the precipitate by filtration.

6. A method of claim 4 wherein said separated oil phase is subjected to further treatment comprising:

(d) heating said separated oil phase to a temperature in the range of about 200° to about 480° C.,

(e) contacting heated, separated oil phase with an adsorbent,

(f) hydrotreating the oil effluent from the contacting with adsorbent,

(g) stripping the oil effluent from the hydrotreating step, and

(h) recovering the resulting stripped oil as a product.

4,287,050

CATALYTIC HYDRODESULFURIZATION OF ORGANIC COMPOUNDS EMPLOYING ALUMINA PROMOTED WITH ZINC TITANATE, COBALT AND MOLYBDENUM AS THE CATALYTIC AGENT

Alan D. Eastman, and Lloyd E. Gardner, both of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartlesville, Okla.

Filed Feb. 28, 1980, Ser. No. 125,437

Int. Cl.³ C10G *45/04, 45/60*

U.S. Cl. 208—215 **18 Claims**

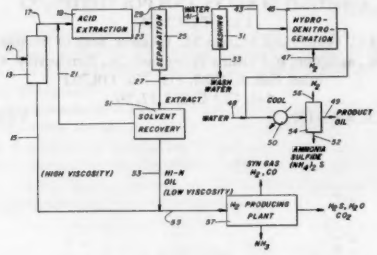
1. A process for the catalytic hydrodesulfurization of an organic sulfur compound comprising the step of contacting said organic sulfur compound under suitable hydrodesulfurization conditions with a catalyst composition comprising catalytic grade alumina, zinc titanate, cobalt, and molybdenum.

17. A process in accordance with claim 1 wherein said catalyst composition is completely sulfided prior to the step of contacting said organic sulfur compound with said catalyst composition.

4,287,051
DISPOSITION OF A HIGH NITROGEN CONTENT OIL STREAM

Daniel J. Curtin, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 8, 1979, Ser. No. 92,553
Int. Cl.³ C10G 67/04, 45/02
U.S. Cl. 208—254 H **11 Claims**



1. A method of denitrogenating a viscous oil containing a relatively high content of nitrogenous compounds and of disposing of the extract oil stream containing a high concentration of the nitrogenous compounds extracted, comprising:

a. forming a first portion and a remaining portion of the viscous oil stream; said remaining portion comprising a first viscous bottom stream that would not be operably pumpable to a partial oxidation unit without the inclusion of viscosity lowering constitutents;

b. extracting the nitrogenous compounds from said first portion of the viscous oil with an operable acid solvent to produce a raffinate oil having a relatively low concentration of nitrogenous compounds such that said raffinate oil can be hydrodenitrogenated at mild conditions with reduced hydrogen consumption; and an extract stream of high content of nitrogenous compounds;

c. recovering the acid solvent from said extract stream, simultaneously producing a small volume stream of low viscosity oil containing a high concentration of nitrogenous compounds and referred to as a high nitrogen content oil;

d. admixing said low viscosity high nitrogen content oil with the remaining portion of said viscous oil comprising said first viscous bottoms stream to provide a pumpable mixed stream;

e. sending said mixed stream to a partial oxidation unit where hydrogen is produced;

f. employing the hydrogen produced in step e to effect hydrodenitrogenation of the raffinate oil by hydrogenating the raffinate oil at mild conditions to produce an ultimate product oil stream; and

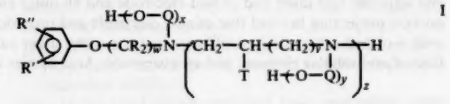
g. recycling said acid solvent to the extracting operation of step b.

4,287,052
ALKYL-SUBSTITUTED PHENYL ETHER AMINE COLLECTORS IN FLOTATION

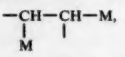
Robert E. Hefner, Jr., Lake Jackson, Tex., and Donald A. Tomalia, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 7, 1980, Ser. No. 137,663
Int. Cl.³ B03D 1/02
U.S. Cl. 209—166 **9 Claims**

1. In a process for beneficiating a siliceous mineral ore by froth flotation with a collector system for the flotation of siliceous matter, the improvement wherein the collector system comprises an effective amount of a compound represented by the formula I



or an acid-neutralized derivative of this compound, wherein R′ is an aliphatic radical having 2 to 22 carbon atoms; R″ is hydrogen or an aliphatic radical having 2 to 22 carbon atoms; each R is independently hydrogen, a C_1–C_4 hydroxyalkyl or C_1–C_4 alkyl; Q is



wherein M at each occurrence is independently hydrogen, methyl or ethyl, with the proviso that Q at each occurrence contains no more than 4 carbon atoms; T is hydrogen or methyl; w is 2 or 3, and v, x, y and z are each independently 0 or 1.

4,287,053
BENEFICIATION OF HIGH CARBONATE PHOSPHATE ORES

James R. Lehr, and Shuang-shii Hsieh, both of Florence, Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation of Ser. No. 146,579, May 5, 1980. This application Dec. 22, 1980, Ser. No. 218,896
Int. Cl.³ B03D 1/06
U.S. Cl. 209—167 **6 Claims**

1. An ore flotation process which comprises the steps of

(1) subjecting a phosphate ore containing carbonate mineral impurities to froth flotation in the presence of a phosphate depressant, said depressant being selected from the group consisting of alkyl phosphonic acids, and a carbonate collector, said collector being a fatty acid;

(2) removing the separated carbonate minerals from the overflow; and

(3) recovering the phosphate values in the underflow.

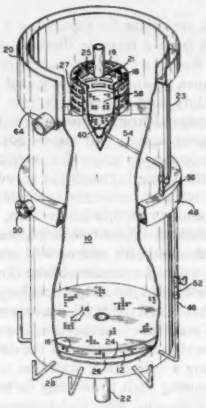
4,287,054
FLOTATION APPARATUS FOR CONCENTRATION OF MINERALS

Clinton A. Hollingsworth, Lakeland, Fla., assignor to The Deister Concentrator Co., Inc., Fort Wayne, Ind.

Filed May 5, 1980, Ser. No. 145,130
Int. Cl.³ B03D 1/24
U.S. Cl. 209—170 **36 Claims**

31. For use in froth flotation apparatus a feed-well device comprising a chamber having an open upper end and a closed bottom, a constriction plate dividing said chamber into upper

and lower compartments, means for introducing aerated water into said lower compartment, the wall of said upper compartment being provided with a plurality of openings for receiving aerated pulp therethrough.



4,287,055

METHOD OF SORTING FIBRE SUSPENSIONS AS WELL AS A PRESSURE SORTER FOR PERFORMING THE METHOD

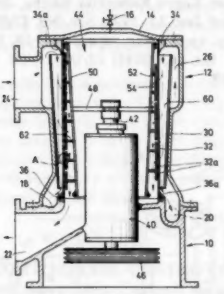
Emil Holz, Eningen, Fed. Rep. of Germany, assignor to Firma Hermann Finckh Maschinenfabrik GmbH & Co., Fed. Rep. of Germany

Filed Jun. 28, 1979, Ser. No. 52,806

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1978, 2830386

Int. Cl.³ B07B *1/04*

U.S. Cl. 209—240 **9 Claims**



1. In a method of sorting fibrous suspension by feeding the suspension under pressure through an inlet to one side of a screen, flowing the suspension over the screen to sort the suspension into a rejected suspension component flowing along the surface of the screen and an accepted suspension component flowing through the openings of the screen to the other side and generating pressure pulses in the accepted suspension component on said other side of the screen to keep the openings free, the improvement comprising flowing the rejected suspension component along the screen surface in a substantially direct path to an outlet at a velocity having a component directly from the outlet to the inlet which is at least three times the velocity of the accepted suspension component through the screen openings, whereby long fiber contaminations are subtantially prevented from entering the screen openings.

4,287,056

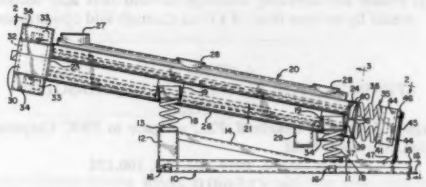
SIFTER STROKE SCREEN

George D. Dumbaugh, and Paul A. Wilson, both of Louisville, Ky., assignors to Kinergy Corporation, Louisville, Ky.

Filed Jun. 16, 1980, Ser. No. 159,762

Int. Cl.³ B07B *1/42*

U.S. Cl. 209—332 **9 Claims**



1. A vibratory sifter screen including a sifter trough and screen assembly mounted on spaced isolators supporting the assembly from a base structure, said assembly having an inlet end and a discharge end, an excitor mounted on the assembly adjacent the inlet end adapted to impart a generally lateral vibratory motion to the assembly at this end, and a drive spring and counterbalance mounted at the discharge end adapted to direct the vibratory mo ion in a linear direction adjacent to the discharge end.

4,287,057

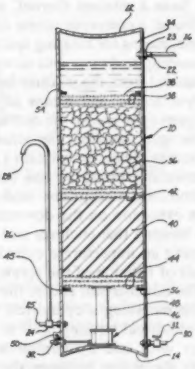
PORTABLE SINK TOP WATER CONDITIONER

Bedford F. Stanley, 4901 E. Sunrise Dr., No. 1614, Tucson, Ariz. 85718

Filed Sep. 2, 1980, Ser. No. 183,320

Int. Cl.³ C02B *1/64*

U.S. Cl. 210—85 **10 Claims**



1. A rechargeable portable water conditioner, said conditioner comprising in combination:

(a) a container, said container including an inlet for receiving the water to be filtered and conditioned and an outlet for discharging the filtered and conditioned water;

(b) a first filtering and conditioning media for removing odor and taste from the water;

(c) a second filtering and conditioning media for removing material in suspension from the water;

(d) a first screen for defining a first chamber intermediate said inlet and said first media;

(e) a second screen for segregating said first media from said second media;

(f) a third screen for defining a second chamber intermediate said second media and said outlet;

(g) weight responsive apparatus disposed in said second chamber for sensing a predetermined mass added to said first, second and third screens and said first and second media through the deposition thereon of material filtered from the water;

(h) means for providing an indication of the need to recharge said conditioner as a result of the added mass sensed by said apparatus; and

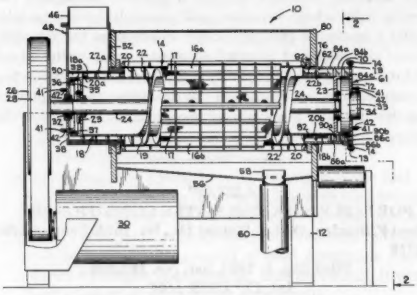
(i) means for effecting recharge of said first and second media by reverse flow of a fluid through said conditioner.

4,287,058

APPARATUS FOR SEPARATING LIQUID-SOLID MIXTURES

Gregory J. Larsen, Lakeland, Fla., assignor to FMC Corporation, San Jose, Calif.

Filed Dec. 4, 1979, Ser. No. 100,174
Int. Cl.³ B01D *25/38*
U.S. Cl. 210—112 **7 Claims**



1. An improved apparatus for separating a liquid phase and a particulate solid from a mixture thereof, said apparatus including a support frame, a conveyor screw rotatably mounted to said support frame, means for rotating said conveyor screw, screen means surrounding said conveyor screw for filtering the particulate solid material from the mixture fed to the upstream end of said conveyor screw, and means adjacent the downstream end of the conveyor screw for restricting the flow of solid phase from the space between the screw and the downstream end of said screen means to maintain a selected pressure on the mixture between said screw and said screen means, wherein the improvement comprises: said flow restricting means including an extension on the downstream end of said conveyor screw, a housing that encloses said screw extension, said housing including an imperforate cylindrical wall that is coaxial with the axis of rotation of the screw and an end wall that is secured to the downstream end of the cylindrical wall, said screw extension including a cylindrical wall that is concentric with said cylindrical housing wall to thereby form an annular passageway with said cylindrical housing wall that communicates with the space between the screw and said screen means and that terminates at said end wall, at least two paddles secured to said screw extension wall for propelling the solid phase of the mixture forced into said annular passageway in an annular path about said screw extension wall, said paddles being arranged in longitudinally spaced relationship on said screw extension wall, said cylindrical housing wall having a discharge opening formed therein in alignment with said paddles, said opening having a downstream edge relative to the direction of rotation of said paddles, valve means within the said discharge opening for restricting flow through said opening, and at least one stripper member attached to said cylindrical housing wall adjacent said downstream edge of the discharge opening and at a position aligned in the space between the paddles, whereby the stripper member aids in forcing the solid phase propelled by said paddles into said discharge opening.

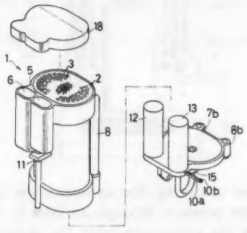
5. An improved apparatus for separating a liquid phase and a particulate solid from a mixture thereof, said apparatus including a support frame, a conveyor screw rotatably mounted to said support frame, means for rotating said conveyor screw, a screen surrounding said conveyor screw for filtering the particulate solid material from the mixture fed to the upstream end of said conveyor screw, and means adjacent the downstream end of the conveyor screw for restricting the flow of solid phase from the space between the screw and the downstream end of said screen to maintain a selected pressure on the mixture between said screw and said screen, wherein the improvement comprises: said flow restricting means including an extension on the downstream end of said conveyor screw, a housing that encloses said extension of the downstream end of the conveyor screw, said housing including an imperforate cylindrical wall that is coaxial with the axis of rotation of the screw and an end wall that is secured to the downstream end of the cylindrical wall, said extension at the downstream end of said screw including a cylindrical wall that is concentric with said cylindrical housing wall to thereby form an annular passageway with said housing wall that communicates with the space between the screw and said screen means and that terminates at said end wall, a paddle secured to said screw extension wall for propelling the solid phase of the mixture forced into said annular passageway in an annular path about said screw extension wall, said cylindrical housing wall having a discharge opening formed therein in alignment with said paddle, said paddle having a face projecting radially from the screw extension and lying in a plane generally parallel to the axis of the screw extension whereby the paddle acts to project the solid phase of the mixture out of said housing through the discharge opening in a path tangential to the path of movement of the paddle.

4,287,059

DIALYZER APPARATUS IN AN ARTIFICIAL KIDNEY SYSTEM

Tadashi Kume, and Isamu Inoh, both of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 13, 1979, Ser. No. 47,999
Claims priority, application Japan, Jun. 15, 1978, 53-71528
Int. Cl.³ B01D *13/00, 19/00*
U.S. Cl. 210—188 **6 Claims**



1. A dialyzer apparatus in an artificial kidney system comprising a dialyzer main body having therein a blood flow passage and a dialyzing liquid flow passage, a top cover member mounted on and connected to the upper surface of the dialyzer main body, a dialyzing membrane separating the blood flow passage and the dialyzing liquid flow passage, said blood flow passage and dialyzing liquid flow passage having respective inlets and outlets, said body having upper and lower surfaces and front and rear surfaces, said body being formed integrally at its front surface with (a) an air removal chamber which is in communication with the outlet of said blood flow passage, (b)

a liquid level adjusting chamber which is in communication with the air removal chamber, and (c) a pipe passage extending downwards from the air removal chamber, said body being also formed integrally at its rear surface with a pair of further pipe passages which are in communication with the inlet and outlet respectively, of the dialyzing liquid flow passage, and a bottom cover member having a pair of chambers formed integrally therewith mounted on and connected to the lower surface of the main body, said bottom cover member including two connection passages constituting an inlet and outlet respectively for said blood flow passage, said inlet passage communicating with one of said chambers, and said outlet passage communicating with the other of said chambers.

4,287,060

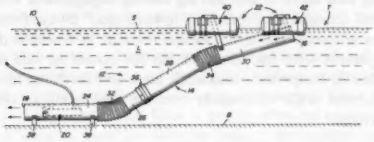
AERATION SYSTEM FOR SOLID BIOLOGICAL WASTE

Everett W. Coggins, Hopedale, Ill., assignor to Confinement Investors, Inc., Hopedale, Ill.

Continuation of Ser. No. 943,743, Sep. 19, 1978, abandoned. This application Jan. 21, 1980, Ser. No. 113,785

Int. Cl.³ C02F *3/02*; B01F *3/04*

U.S. Cl. 210—194 **5 Claims**



1. An aeration system for treating solid biological wastes, comprising, in combination:

(1) a storage area having a bottom and arranged for holding a slurry of solids and liquids to be treated; and

(2) circulating means disposed in the storage area for drawing air and slurry from the surface of the slurry in the storage area and discharging the surface air and slurry into the slurry adjacent the bottom of the storage area, wherein the circulating means consists essentially of:

(a) a duct means having an inlet and outlet and disposed in the storage area so as to be immersible in the slurry forming a fluid flow path through the slurry, said duct means consisting of a hollow tube means extending from the surface of said slurry to adjacent the bottom of said storage area;

(b) propeller pump means positioned in the duct means and disposed adjacent said outlet for drawing slurry through the duct means from the inlet to the outlet; and

(c) float means connected to the duct means adjacent said inlet for positioning the inlet of the duct means adjacent the surface of the slurry so that a major portion of said inlet is immersed in said slurry.

4,287,061

ROTATING COIL CENTRIFUGE

Ian A. Sutherland, Harpenden, England, assignor to National Research Development Corporation, London, England

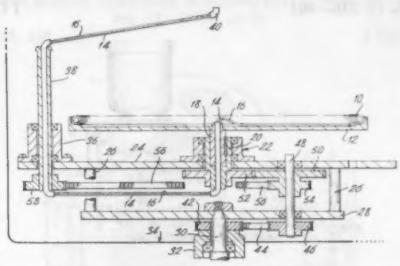
Filed Oct. 24, 1979, Ser. No. 88,054

Claims priority, application United Kingdom, Oct. 26, 1978, 42034/78

Int. Cl.³ B01N *15/08*

U.S. Cl. 210—198.2 **11 Claims**

11. A centrifuge comprising a centrifuge plate fixed to a hollow central shaft; first rotation means to rotate the hollow central shaft whereby the centrifuge plate rotates about a central axis; a support tube which passes through the hollow central shaft; second rotation means to rotate the support tube at a speed which differs slightly from the speed of rotation of the hollow central shaft; support means for supporting on the centrifuge plate at least one convoluted tube near the periphery of the plate, the tube being convoluted about an axis of convolution which is generally perpendicular to the local direction of the centrifugal force generated by rotation of the centrifuge plate; connection means between the support tube and the at least one convoluted tube whereby the at least one convoluted tube is rotated about an axis parallel to the axis of



convolution during rotation of the centrifuge plate and at a predetermined speed which is independent of said rotation; and means for supplying inlet and outlet tubes to the at least one convoluted tube in a twist free manner, the inlet and outlet tubes passing through the support tube; and drive means connected to the first and second rotation means.

4,287,062

APPARATUS FOR BIOLOGICAL PURIFICATION OF SEWAGE

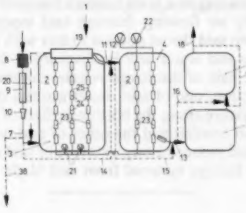
Reinhart von Nordenskjöld, Ernst-Heinkel-Ring, D-8011 Hohenbrunn, Fed. Rep. of Germany

Filed Aug. 2, 1979, Ser. No. 63,046

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1978, 2834899

Int. Cl.³ C02F *3/20, 7/00*

U.S. Cl. 210—199 **26 Claims**



1. Apparatus for the biological purification of sewage by aerobic treatment with active sludge comprising:

at least one basin (**3**) for receiving the sewage and having an inlet and an outlet; and

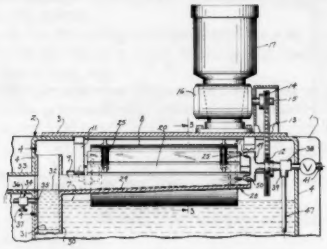
aeration means mounted in said basin, said aeration means including at least one elongated flexible carrier (**25**) extending across said basin, said carrier lying generally proximate the exposed upper surface of the sewage and having a predetermined amount of longitudinal slack therein, and a plurality of bottom aerators (**24**) suspended at spaced intervals along said carrier into proximity with the bottom of said basin, said aerators being coupled to an air supply conduit for discharging aerobic treatment air into the sewage and propelling said aeration means by the discharge of the air in a reciprocal motion transversely of the extension of said carrier.

4,287,063

APPARATUS FOR SEPARATING LIQUIDS

Wallace I. Stenzel, Thiensville, Wis., assignor to Waukee Engineering Company Inc., Milwaukee, Wis.

Filed Oct. 29, 1979, Ser. No. 88,832
Int. Cl.³ B01D *33/06*
U.S. Cl. 210—402 **1 Claim**



1. An apparatus for separating oil from water, comprising a vessel to contain a body of water, a drum partially submerged in the water and having an outer surface to which a film of a mixture of water and oil adheres during rotation of said drum, a doctor blade to rotate against the outer surface of the drum and remove the mixture from said surface, an inclined trough disposed adjacent the periphery of the drum to receive said mixture from the doctor blade, a conduit located adjacent the low end of the trough and having an upper end disposed above the level of water in the vessel and having an open lower end located beneath the level of water in the vessel, said mixture of water and oil flowing by gravity along the lower surface of the trough into said conduit and said water flowing downwardly through said conduit and being discharged from the lower open end of the conduit into said body of water, said oil collecting as a layer in the upper end portion of the conduit, means for removing the collected oil layer from the conduit, and cleaning means comprising an aspirating unit having an inlet section connected to a source of gas under pressure and having an outlet section and having a throat portion disposed between said inlet and outlet portions, a tube having its upper end communicating with said throat portion and having its lower end extending to a level beneath the level of the body of water whereby air flowing through said aspirating unit will draw water into said throat portion to mix with the gas and the mixture of gas and water will be discharged from said outlet section, and a pair of discharge nozzles communicating with said outlet section, one of said outlet nozzles disposed to discharge said mixture along the bottom surface of said trough for delivery to said conduit and the other of said nozzles disposed to distribute said mixture along a surface of said doctor blade to thereby clean foreign material from said blade.

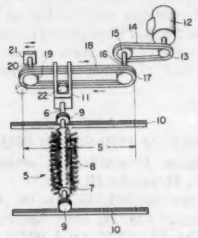
4,287,064

BRUSH DRIVING APPARATUS FOR A SOLID-LIQUID SEPARATION SCREEN

Seiya Ando, Mitaka, and Kozi Inoue, Osaka, both of Japan, assignors to Kabushiki Kaisha Ando Screen Seisakujo, Japan

Filed Jun. 5, 1980, Ser. No. 156,575
Claims priority, application Japan, Jun. 11, 1979, 54-73198
Int. Cl.³ B07B *1/52*
U.S. Cl. 210—413 **4 Claims**

1. A means for cleaning a liquid-solid separation screen having a plurality of parallel wires, a brush having elements capable of passing between said wires to remove solids lodged therein; a shaft mounting said brush and means supporting said shaft for reciprocal movement lengthwise of said wires; said means including elements at opposite ends of said brush rotatably supporting said shaft for reciprocal movement in a single plane parallel with said screen, said elements including a roller on said shaft and an elongated support member therefor, said roller making positive rolling engagement with said support member for rotating said shaft and brush as the same moves lengthwise of said wires and support member; an endless member and a pair of pulleys supporting the same for continuous movement in one direction with advance and return runs parallel with said wires; drive means mounted on and projecting from one side of said endless member; a motion transmitting member mounted on said shaft and engaging said drive



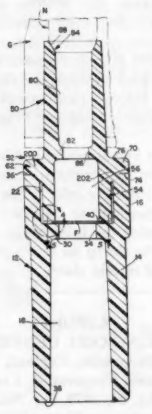
means; said drive means having sliding engagement with said motion transmitting member toward and away from said screen whereby said drive means remains in constant driving engagement with said shaft; means for powering said endless member to reciprocate said shaft back and forth the length of said screen while alternately rotating said brush in opposite directions.

4,287,065

FILTER HUB ASSEMBLY

Kenneth Raines, Bethlehem, Pa., assignor to Burron Medical Inc., Bethlehem, Pa.

Filed Oct. 30, 1979, Ser. No. 89,368
Int. Cl.³ B01D *29/00*
U.S. Cl. 210—445 **2 Claims**



1. A filter hub assembly for use in drug reconstitution procedures comprising:

an elongate female filter hub having a coupling sleeve on one end thereof, a fluid passage defined longitudinally therethrough and an annular support shoulder at one end of said hub, said support shoulder having a fluid passage defined therethrough to be in fluid communication with said filter hub fluid passage;

an elongate male needle accommodating unit having a base on one end thereof and a fluid passage defined longitudinally therethrough, said needle accommodating unit fluid

passage being sized and adapted to mount a needle therein, said needle accommodating unit including an energy director element and a sealing shoulder on said base, said base being accommodated in said coupling sleeve and ultrasonically welded thereto with said energy director forming a connecting means between said filter hub and said needle accommodating unit with said base and female filter hub fluid passages being in fluid communication with each other, said energy director element forming a shear joint between said female filter hub unit and said needle accommodating unit;

a filter located between said filter hub fluid passage and said needle accommodating unit base fluid passage for filtering fluid passing through the assembly, said filter being supported on said filter hub support shoulder and having an outer peripheral size smaller than the inner peripheral size of said coupling sleeve so that a gap is defined between said filter outer periphery and the inner periphery of said hub; and

a rim on said base, said rim including a planar portion which contacts said hub support shoulder in said gap outside said filter outer periphery, said rim further including a beveled portion which slopes upwardly from said planar portion to said needle accommodating unit fluid passage, said beveled portion clamping said filter against said hub support shoulder when said rim planar portion contacts said hub support shoulder in said gap outside said filter outer periphery so that said filter is gently clamped against said hub support shoulder without causing any sudden reduction in filter thickness.

4,287,066

SIEVE HAVING SUBSTANTIALLY PLANE SIEVE SHEETS AND A METHOD FOR ITS MANUFACTURE

Albert Greutert, Sachseln, and Ernst Stumvoll, Sarnen, both of Switzerland, assignors to Elfo AG Sachseln, Sachseln, Switzerland

Filed Sep. 8, 1976, Ser. No. 721,632

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1975, 2540532

Int. Cl.[3] B01D *35/02, 39/20;* B29F *1/10*

U.S. Cl. 210—464 **11 Claims**

1. A sieve having at least one substantially planar sieve surface comprising: a sieve sheet defining the planar sieve surface and including slots extending through the sheet and dividing the sheet into a plurality of sieve sheet sections, the slots being arranged so that the sections can be deflected out of their common plane; and a plastic material filling the slots, securing to each other portions of the sections adjoining the slots and maintaining the sections deflected out of their common plane by a relatively minor amount.

4,287,067

WATER FILTER FOR RADIATORS

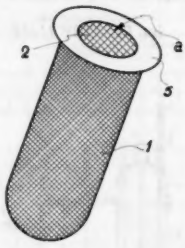
Moises Dyner, Buenos Aires, Argentina, assignor to Marcos Berstein, Buenos Aires, Argentina

Filed Feb. 4, 1980, Ser. No. 118,341

Claims priority, application Argentina, Feb. 2, 1979, 275435

Int. Cl.[3] B01D *29/04*

U.S. Cl. 210—487 **1 Claim**



1. An automobile radiator water filter comprising:

a generally cup-shaped external filter screen having a generally cylindrical sidewall and a generally hemispherical base wall and having a relatively fine mesh width and an open end;

a generally cup-shaped internal filter screen having a generally cylindrical sidewall and a generally hemispherical base wall and having a relatively larger mesh width than that of said external filter screen, said internal filter being disposed within said external filter and having an open end;

support means disposed between said screens for maintaining them in a fixed, spaced-apart relationship to one another, said support means including side supports disposed between the sidewalls of said screens and a base support disposed between the base walls of said screens; and

a flat, annular coupling flange disposed across and joining together the open ends of said screens, said flange having an annular lip projecting laterally beyond the open end of said external screen which serves to mount said filter in a radiator inlet.

4,287,068

POWDERED METAL FILTER COMPOSITION AND PROCESSES FOR PRODUCING THE SAME

James G. Bewley, Tinton Falls, N.J., assignor to Metallurgical International, Inc., Tinton Falls, N.J.

Continuation-in-part of Ser. No. 915,383, Jun. 14, 1978, Pat. No. 4,166,736. This application Sep. 4, 1979, Ser. No. 72,415

Int. Cl.[3] B01D *39/20;* B22D *23/08;* C22C *38/02*

U.S. Cl. 210—510 **17 Claims**

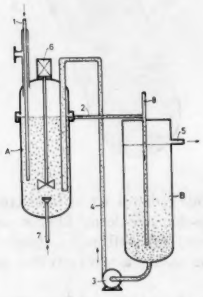
1. A powdered metal filter composition consisting essentially of

(a) a ferrous based alloy having by weight from approximately 0.60% to approximately 4.0% silicon; from approximately 0.05% to approximately 0.20% Carbon; and up to approximately 2.0% molybdenum; and exhibiting an apparent density of approximately 1.6 to 2.3 gr./cm.[3]

4,287,069
PROCESS FOR THE IMPROVED WORKING UP OF EFFLUENT

Artur Reischl, Leverkusen; Kurt Mack, Wuppertal, and Friedhelm Sahlmen, Moers, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 5, 1980, Ser. No. 146,919
Claims priority, application Fed. Rep. of Germany, May 21, 1979, 2920526
Int. Cl.³ C02F *11/14*
U.S. Cl. 210—609 **9 Claims**



1. A process for the separation of aqueous sludges in the purification of effluents in purification plants, comprising:

(a) mixing organic and/or inorganic aqueous sludges with ground monomer-free tolylene diisocyanate (TDI) distillation residues having a mean particle size of less than 2 mm;

(b) removing the water from the resulting purified sludges; and

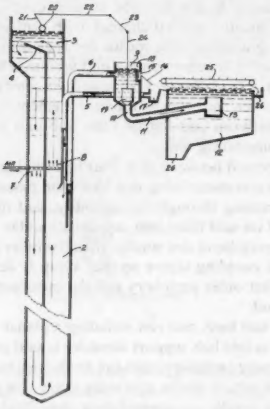
(c) disposing of the purified sludges.

4,287,070
METHOD MAINTAINING A CONSTANT GAS TO SOLIDS RATIO IN EFFLUENT FROM A LONG VERTICAL SHAFT BIOREACTOR

David C. I. Pollock, Richmond Hill, Canada, assignor to C-I-L Inc., Montreal, Canada

Filed Jun. 13, 1980, Ser. No. 159,352
Claims priority, application Canada, Oct. 26, 1979, 338537
Int. Cl.³ C02F *3/12*
U.S. Cl. 210—626 **4 Claims**

1. In a modified activated sludge waste treatment method wherein an aerobic biological reaction takes place during the continuous circulation of aerated fluid waste in an apparatus including a basin, a long vertical downcomer chamber, a long vertical riser chamber operatively communicating with the downcomer through the basin and at the lower end of the downcomer and a sludge separation means operatively communicating with the riser, an improvement whereby the dispersed and dissolved gas content of the waste fluid can be maintained which comprises removing effluent waste from the said riser chamber and discharging the said effluent waste into a cylindrical vessel positioned between said riser chamber and said sludge separation means, and at a higher elevation than the said sludge separation means, discharging the said effluent waste from the said cylindrical vessel selectively in controlled volumes to said separation means or to return said effluent waste to said riser chamber in response to the level of waste liquor in the said basin the said basin waste level and consequent pressure exerted thereby upon the fluid in the said apparatus being a means to govern the gas content in the said waste.



4,287,071
SIMULTANEOUS EXTRACTION OF MORE THAN ONE ION BY LIQUID MEMBRANE PROCESS

Peter M. DiGiacomo, Mission Viejo, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Oct. 10, 1979, Ser. No. 83,500
Int. Cl.³ B01D *11/04*
U.S. Cl. 210—643 **11 Claims**

1. A liquid membrane process for removing ions from solution which comprises:

(a) contacting a solution comprising a first ion and a second ion with an emulsion, said emulsion comprising an external phase which is immiscible with said solution and comprises a first complexing agent and a second complexing agent, said first complexing agent being capable of forming a first complex with said first ion and said second complexing agent being capable of forming a second complex with said second ion, both of said complexes being soluble in said external phase, and an internal phase, which comprises (1) decomplexing agent, said decomplexing agent being capable of converting said first complex into said first complexing agent and said first ion, and (2) an inhibiting agent which is capable of inhibiting the formation of said first complex;

(b) forming in said external phase a first complex of said first ion and said first complexing agent and a second complex of said second ion and said second complexing agent; and

(c) decomplexing the first complex in said internal phase whereby the first ion remains in said internal phase, and said second ion remains in said external phase in said second complex.

11. A liquid membrane process for removing metallic ionic impurities contained in a phosphoric acid solution, and separating such ionic impurities, which comprises:

(a) contacting the phosphoric acid solution containing a first ionic impurity selected from the group consisting of magnesium, calcium, aluminum, iron and mixtures thereof, and as a second ionic impurity uranium ion with an emulsion comprising an external phase which is immiscible with said phosphoric acid and comprising a first complexing agent which is a sulfonate capable of forming a first complex with said first ionic impurity and a second complexing agent selected from the group consisting of phosphonates and pyrophosphates capable of forming a second complex with uranium ion, said first complexing agent,

said second complexing agent, said first complex, and second complex being soluble in said external phase and an internal phase comprising a strong acid;

(b) forming in said external phase a first complex of said first ionic impurity of said first complexing agent and a second complex of uranium with said second complexing agent; and

(c) decomplexing said first complex by action of said strong acid on said first complex in said internal phase whereby said first ionic impurity remains in said internal phase and the uranium remains in said external phase in said second complex.

4,287,072

WATER TREATMENT BY ION EXCHANGE RESIN

Jesse S. Beecher, Morristown, N.J., assignor to Drew Chemical Corporation, Boonton, N.J.

Filed Oct. 18, 1979, Ser. No. 86,049
Int. Cl.[3] C02F *5/08, 1/42*
U.S. Cl. 210—668 9 Claims

1. In a process for treating water by passing the water through an ion exchange resin, the improvement comprising:

adding a catalyzed hydrazine compound to the water being treated prior to passage through the ion exchange resin in an amount effective to reduce iron fouling of the ion exchange resin; and passing the water containing said catalyzed hydrazine through the ion exchange resin to effect treatment of the water.

4,287,073

WATER-BASED FORGING LUBRICANT

Sulekh C. Jain, Shrewsbury, and Charles A. Morris, Grafton, both of Mass., assignors to Wyman-Gordon Company, Worcester, Mass.

Division of Ser. No. 712,702, Aug. 9, 1976, Pat. No. 4,104,178, which is a continuation of Ser. No. 625,592, Nov. 24, 1975, Pat. No. 3,983,042. This application May 30, 1978, Ser. No. 910,842
Int. Cl.[3] C10M *3/14, 3/04, 3/02*
U.S. Cl. 252—30 9 Claims

1. A forging lubricant, comprised of a water base and at least a minor effective amount of sodium molybdate.

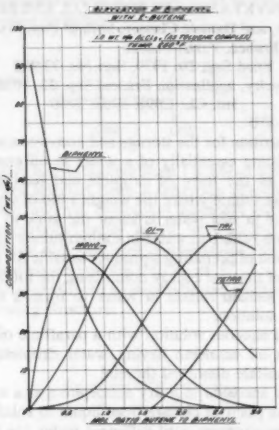
3. A forging lubricant as recited in claim 1, including at least a minor effective amount of graphite.

4,287,074

SEC-YLBIPHENYL COMPOSITION AND PROCESS FOR PREPARING THE SAME

Harold W. Earhart, Corpus Christi, Tex., and Donald F. Rugen, Wilmington, Del., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Apr. 28, 1980, Ser. No. 144,490
Int. Cl.[3] B01F *1/00;* H01B *3/22*
U.S. Cl. 585—6.3 6 Claims



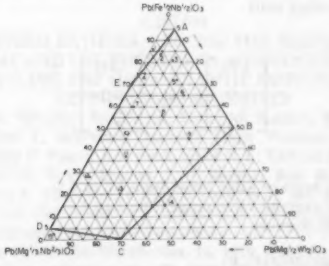
1. A water-white, essentially odorless liquid composition useful as a dielectric oil and as a dye solvent, consisting essentially of about 82% to about 88% by weight of mono-sec-butylbiphenyl and about 12% to about 18% of di-secbutylbiphenyl.

4,287,075

HIGH DIELECTRIC CONSTANT TYPE CERAMIC COMPOSITION CONSISTING ESSENTIALLY OF $Pb(Fe_{1/2}Nb_{1/2})O_3$-$Pb(Mg_{1/3}Nb_{2/3})O_3$-$Pb(Mg_{1/2}W_{1/2})O_3$

Shinobu Fujiwara; Kiyoshi Furukawa; Nobuaki Kikuchi, all of Akita; Osamu Iizawa, Honjo; Hitoshi Tanaka, Akita, and Hisayoshi Ueoka, Yachiyo, all of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Apr. 16, 1979, Ser. No. 30,384
Claims priority, application Japan, Apr. 17, 1978, 53/44964; May 29, 1978, 53/64130; May 30, 1978, 53/64513; May 30, 1978, 53/64515; May 30, 1978, 53/64516; Jun. 16, 1978, 53/73012; Jun. 22, 1978, 53/75630; Jul. 3, 1978, 53/80651
Int. Cl.[3] H01B *3/12*
U.S. Cl. 106—39.5 41 Claims



1. A high dielectric constant type-, ceramic composition hereinafter referred to as the basic ceramic composition, which comprises from 64.80 to 68.58% of PbO, from o to 11.46% of

Fe_2O_3, from 0.3 to 3.92% of MgO, from 9.65 to 26.89% of Nb_2O_5 and from 0 to 16.83% of WO_3, all percentages being by weight based on the basic ceramic composition, and wherein the basic composition falls within the area defined by the polygon A-B-C-D-E of FIG. 1 attached to the specification but not including the lines A-B-C-D-E.

4,287,076

PRODUCT SUITABLE FOR THE STORAGE AND CONVEYANCE OF THERMAL ENERGY

Lucien Babin, and Daniele Clausse, both of Pau, France, assignors to Elf France, Paris, France

Filed Sep. 10, 1979, Ser. No. 73,992
Claims priority, application France, Sep. 22, 1978, 78 27166
Int. Cl.³ C09K *5/02, 5/00*
U.S. Cl. 252—70 **14 Claims**

1. A composition for the storage and conveyance of thermal energy consisting essentially of a water in oil emulsion, said water being in the form of droplets and having dissolved therein sodium sulfate where the weight ratio of said dissolved sodium sulfate in said water is about the same as the weight ratio of sodium sulfate to water in sodium sulfate decahydrate.

11. A method of preparing a product suitable for storage and conveyance of thermal energy comprising the following steps:

dissolving sodium sulfate in water to form a monophasic aqueous solution;

mixing said aqueous solution with a paraffinic oil to form a water in oil emulsion having water droplets with said sodium sulfate dissolved therein;

placing the emulsion in a dry atmosphere at a temperature above the point of change from liquid to solid of sodium sulfate decahydrate until sufficient water has evaporated from said droplets to increase the weight ratio of said sodium sulfate dissolved in said water to about the same ratio of sodium sulfate to water as sodium sulfate decahydrate.

4,287,077

GLYCOL COMPOSITIONS CONTAINING AN ETHER MODIFIED SILICONE TO INHIBIT GELLING

Phillip L. Wing, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

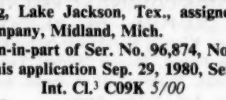
Continuation-in-part of Ser. No. 96,874, Nov. 23, 1979, abandoned. This application Sep. 29, 1980, Ser. No. 191,798
Int. Cl.³ C09K *5/00*
U.S. Cl. 252—75 **11 Claims**

1. A gellation resistant aqueous glycol composition comprising

(A) 85 to 98 percent by weight of an alkylene glycol, an alkylene glycol ether, or mixtures thereof,

(B) an effective amount to reduce corrosion of an alkali metal silicate,

(C) an effective amount to improve gellation resistance of a glycol soluble ether modified silicone copolymer comprising the repeating units



wherein

x has an average value range from 1.8 to 6.8

y has an average value range from 1 to 4

Z has the formula

$$-R-(C_nH_{2n}O)_m-R_1$$

where

n is 2 or 3

m has an average value such that the average molecular weight of the polyoxyalkylene chain is in the range 100–400

R is an alkylene chain of 2–4 carbons and

R_1 is selected from the group consisting of hydrogen and alkyl groups of 1–4 carbons

(E) the remainder being water and an effective amount of one or more other corrosion inhibitors.

4,287,078

SURFACTANTS DERIVED FROM THE REACTION PRODUCT OF POLYOXYALKYLENE POLYOLS AND POLYGLYCIDYL ETHERS AND GLYCOL-BASED ANTIFREEZE USING SAME

William K. Langdon, and Lester G. Lundsted, both of Grosse Ile, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 28, 1980, Ser. No. 115,793
Int. Cl.³ C09K *5/00;* **C07C** *43/10*
U.S. Cl. 252—76 **18 Claims**

1. A material formed by the reaction of (1) a poly-2-hydroxyalkyl derivative of a polyol having at least 5 hydroxyl groups, with at least 3 of said hydroxyl groups being substituted with 2-hydroxyalkyl groups and (2) a hydrophobic polyglycidyl ether of a polyoxyalkylene polyol said polyoxyalkylene polyol having a molecular weight greater than about 300.

9. An antifreeze composition comprising a glycol freezing point depressant, a corrosion inhibitor system, and a foam suppressing agent present in an amount of from about 0.001% to about 0.1% by weight of the antifreeze composition; said foam suppressing agent comprising the reaction product of (1) a poly-2-hydroxyalkyl derivative of a polyol having at least 5 hydroxyl groups, with at least 3 of said hydroxyl groups being substituted with one or more 2-hydroxyalkyl groups and (2) a hydrophobic polyglycidyl ether of a polyoxyalkylene polyol, said polyoxyalkylene polyol having a molecular weight greater than about 300.

4,287,079

LIQUID CLEANSER FORMULA

Ronald A. Robinson, Garden Grove, Calif., assignor to Purex Corporation, Lakewood, Calif.

Filed Jun. 2, 1980, Ser. No. 155,571
Int. Cl.³ C11D *7/54*
U.S. Cl. 252—99 **9 Claims**

1. An aqueous cleaning composition to be applied from a squirt bottle comprising

(a) about 5 up to 20 weight percent of particulate abrasive selected from the group consisting of diatomaceous earth, calcium carbonate, $Ca_3(PO_4)_2$, $Ca(PO_3)_2$, zeolite feldspar, zirconium silicate, calcium silicate, titanium oxide, ZnO_2, CaO, Al_2C_3 and silica;

(b) a two part thickener consisting essentially of a mixture of fumed silicon dioxide and smectite clay, the fumed silicon dioxide being present in weight percent amount between about 1 and 5, the clay being present in weight percent amount between about 4 and 15;

(c) about 18 up to 40 weight percent weak aqueous hypohalite bleach solution, the hypo-halite selected from the group consisting of sodium hypochlorite, potassium hypochlorite, calcium hypochlorite, magnesium hypochlorite, lithium hypochlorite and hypobromite;

(d) about 2 up to 15 weight percent alkaline builder salt selected from the group consisting of potassium carbonate, Na_2CO_3, NaOH, KOH, $Na_4P_2O_7$, $K_4P_2O_7$, $Na_5P_3O_{10}$, $K_4P_3O_{10}$, Na_3PO_4, K_3PO_4, $NaSiO_3$, $Na_2O:2SiO_2$, and

(e) water in an amount which is in excess of 50% by weight of the composition.

4,287,080

DETERGENT COMPOSITIONS WHICH CONTAIN CERTAIN TERTIARY ALCOHOLS

Michael P. Siklosi, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 17, 1979, Ser. No. 76,002
Int. Cl.[3] C11D *7/54, 7/50*
U.S. Cl. 252—104 14 Claims

1. A detergent composition consisting essentially of:

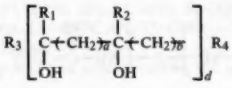
A. 0.05% to 50% of a surfactant selected from the group consisting of anionic, cationic, nonionic, zwitterionic, and amphoteric surfactants; and

B. 0.5% to 50% of a tertiary alcohol having at least 5 carbon atoms and less than 100 carbon atoms per molecules, said tertiary alcohol being selected from the group consisting of:

(A) heterosubstituted or unsubstituted monohydric alcohols having the following molecular structure:

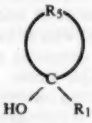
wherein R_1, R_2 and R_3 contain from 1 to about 20 carbon atoms and are selected from a subgroup consisting of alkyl, cycloalkyl, carboxyl, carboxylate salt, ester, carbonyl, ether, nitrile, aryl, aralkyl, alkaryl, and aldehyde moieties, and combinations thereof;

(B) unsubstituted alcohols having the following molecular structure:



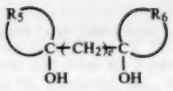
wherein R_1, R_2 and R_3 contain from 1 to about 20 carbon atoms and are selected from a subgroup consisting of alkyl, alkenyl, alkynyl, cycloalkyl, carboxyl, carboxylate salt, ester, carbonyl, ether, nitrile, aryl, aralkyl, alkaryl, and aldehyde moieties, and combinations thereof, R_4 is selected from the same group as R_1, a is from 0 to about 8, b is from 0 to about 8, d is from 1 to about 4, and the values of a and b are separately selected for each repetition of d, if d is greater than 1;

(C) heterosubstituted or unsubstituted alicyclic alcohols having the following molecular structure:



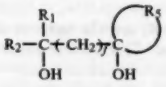
wherein R_1 contains from 1 to about 20 carbon atoms and are selected from a subgroup consisting of alkyl, alkenyl, alkynyl, cycloalkyl, carboxyl, carboxylate salt, ester, carbonyl, ether, nitrile, aryl, aralkyl, alkaryl, and aldehyde moieties, and combinations thereof; R_5 is a substituted or unsubstituted cyclic chain of 2 to 20 carbon atoms;

(D) hetero unsubstituted alicyclic alcohols having the following structure:



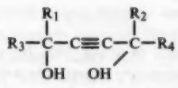
wherein R_5 is as defined above, R_6 is selected from the same group as R_5, and e is 1 to about 8;

(E) heterosubstituted or unsubstituted alcohols having the following structure:



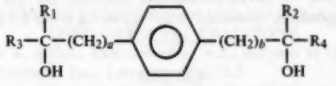
wherein R_1, R_2 contain from 1 to about 20 carbon atoms and are selected from a subgroup consisting of alkyl, alkenyl, alkynyl, cycloalkyl, carboxyl, carboxylate salt, ester, carbonyl, ether, nitrile, aryl, aralkyl, alkaryl, and aldehyde moieties; and combinations thereof; R_5 is as defined above and f is 0 to about 8;

(F) heterosubstituted or unsubstituted alcohols having the following structure:



wherein R_1, R_2, R_3 contain from 1 to about 20 carbon atoms and are selected from a subgroup consisting of alkyl, alkenyl, alkynyl, cycloalkyl, carboxyl, carboxylate salt, ester, carbonyl, ether, nitrile, aryl, aralkyl, alkaryl, and aldehyde moieties, and combinations thereof; R_4 is as defined above; and

(G) heterosubstituted or unsubstituted alcohols having the following structure:



wherein R_1, R_2, R_3 contain from 1 to about 20 carbon atoms and are selected from a subgroup consisting of alkyl, alkenyl, alkynyl, cycloalkyl, carboxyl, carboxylate salt, ester, carbonyl, ether, nitrile, aryl, aralkyl, alkaryl, and the aldehyde moieties, and combinations thereof; R_4, a, and b are defined above.

4,287,081

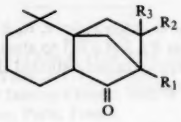
BRIDGED KETONES, PROCESS FOR PREPARING SAME AND USE THEREOF IN AUGMENTING OR ENHANCING THE ORGANOLEPTIC PROPERTIES OF CONSUMABLE MATERIALS

Mark A. Sprecker, Sea Bright; James M. Sanders, Eatontown; William L. Schreiber, Jackson; Hugh Watkins, Lincroft; Joaquin F. Vinals, Red Bank, all of N.J.; Edward J. Shuster, Brooklyn, N.Y.; Thomas J. O'Rourke, Red Bank, N.J.; Myrna L. Hagedorn, Highland Park, N.J., and Philip Klemarczyk, Old Bridge, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 95,149, Nov. 16, 1979, Pat. No. 4,250,338.
This application Oct. 23, 1980, Ser. No. 200,024
Int. Cl.[3] C11D *3/50, 9/44*
U.S. Cl. 252—174.11 1 Claim

1. A process for augmenting or enhancing the aroma of a solid or liquid anionic, cationic or nonionic detergent compris-

ing the step of adding in an aroma augmenting or enhancing quantity to a solid or liquid anionic, cationic or nonionic detergent base at least one substantially pure tricyclic ketone having the structure:



wherein R_1, R_2 and R_3 are the same or different and each represents hydrogen or C_1–C_3 lower alkyl.

4,287,082

HOMOGENEOUS ENZYME-CONTAINING LIQUID DETERGENT COMPOSITIONS CONTAINING SATURATED ACIDS

Flavio Tolfo, Brussels, and Christian R. Barrat, Meise, both of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 22, 1980, Ser. No. 123,856
Int. Cl.³ C11D *7/42*
U.S. Cl. 252—174.12 **9 Claims**

1. A homogeneous aqueous liquid detergent composition consisting essentially of:

(a) from about 20% to about 50% by weight of organic synthetic surface-active agent selected from the group consisting of anionic and nonionic surfactants;

(b) from about 3% to about 15% by weight of saturated fatty acid having from 12 to 14 carbon atoms in the alkyl chain;

(c) from 0.04% to 0.4% by weight of enzyme selected from the group consisting of proteases and mixtures of proteases and amylases;

(d) from 0.1% to 3% by weight of carboxylic acid or salt thereof selected from the group consisting of acetic acid, formic acid and sodium formate;

(e) from 0.5 to 1.5 millimoles per kilo of the detergent composition of enzyme-accessible calcium; the pH of the composition, measured at 20° C., being from 6.5 to 8.5.

4,287,083

PHOTOINITIATION SYSTEMS FOR FREE RADICAL POLYMERIZATION REACTIONS

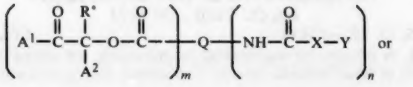
John R. McDowell, Erie; Dennis D. Howard, Girard, and Vincent J. Pascarella, Erie, all of Pa., assignors to Lord Corporation, Erie, Pa.

Division of Ser. No. 950,970, Oct. 13, 1978, Pat. No. 4,224,454. This application Jun. 18, 1979, Ser. No. 49,675
Int. Cl.³ C08K *5/16*; C08J *7/00*
U.S. Cl. 252—182 **11 Claims**

1. A photocatalyst system consisting essentially of

(a) at least one photosensitizer which is effective to promote free radical polymerization through bimolecular photochemical reactions of the energy donor type, the hydrogen abstraction type, or by formation of a donor-acceptor complex with monomers or additives leading to ionic or radical species; and

(b) at least one photoinitiator which promotes free radical polymerization by generating reactive specie by way of unimolecular homolysis resulting from photoexcitation, said photoinitiator having the formula



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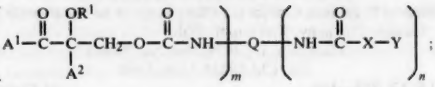
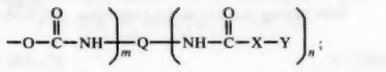


;

wherein

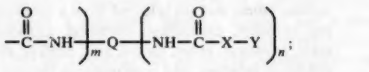
A^1 and A^2 are the same or different and each is a benzenoid or nonbenzenoid aromatic radical;

R^0 is hydrogen, or an aliphatic, cycloaliphatic or aromatic radical containing from 1 to 9 carbon atoms, or—OR^2, or



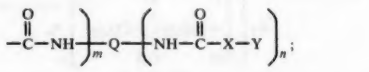
;

R^1 is hydrogen or an aliphatic, cycloaliphatic or aromatic radical containing from 1 to 9 carbon atoms, or —R^3—O—R^4, or



;

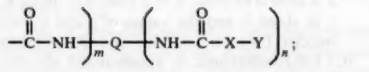
R^2 is hydrogen, or an aliphatic, cycloaliphatic or aromatic radical having from 1 to 9 carbon atoms, or —R^3—O—R^4, or



;

R^3 is a divalent aliphatic, cycloaliphatic or aromatic radical containing from 1 to 9 carbon atoms;

R^4 is a hydrogen, or an aliphatic, cycloaliphatic or aromatic radical having from 1 to 9 carbon atoms, or



;

Q is the monovalent or polyvalent residue of a monomeric aliphatic, cycloaliphatic or aromatic isocyanate compound having at least one isocyanate group, which residue remains after reaction of all isocyanate groups of such monomeric compound with at least one saturated or unsaturated compound containing at least one isocyanate-reactive active hydrogen atoms;

X is selected from the group consisting of —O—, —S—, and >N—R^5, wherein R^5 is hydrogen or an alkyl group having from 1 to 9 carbon atoms;

Y is hydrogen or the organic residue of a saturated or unsaturated organic compound containing at least one isocyanate-reactive active hydrogen atom, which residue remains after reaction of at least one such active hydrogen atom with an isocyanate moiety;

m is a number in the range from 1 to f, wherein f is the total number of isocyanate groups per molecule of isocyanate compound; and

n is equal to f-m.

4,287,084

USE OF MIXTURE OF ALIPHATIC C_{10} BRANCHED OLEFINS IN AUGMENTING OR ENHANCING THE AROMA OF PERFUMED ALKALINE METAL HYPOCHLORITE SOLUTIONS

Richard M. Boden, Monmouth Beach; Lambert Dekker, Wyckoff; Frederick L. Schmitt, Homdel, all of N.J., and Augustinus G. Van Loveren, Rye, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jun. 19, 1980, Ser. No. 160,788
Int. Cl.[3] C11D *7/54, 3/395, 3/50*
U.S. Cl. 252—187 H 2 Claims

1. A process for augmenting or enhancing the aroma of a liquid bleach containing hypochlorite ion comprising the step of adding to a liquid bleach composition one or more diisoamylene-containing compositions produced by the step of reacting 2 moles of diisoamylene in the presence of an acid catalyst, the concentration of said diisoamylene-containing composition being in an organoleptic property modifying amount.

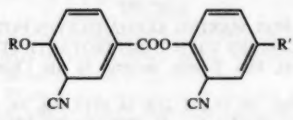
4,287,085

(2'-CYANO-4'-ALKYLPHENYL)-3-CYANO-4-ALKOXYBENZOATES AND LIQUID CRYSTAL COMPOSITION INCLUDING SAME

Katsumori Takei; Sadao Kanbe, and Yoshio Shionozaki, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

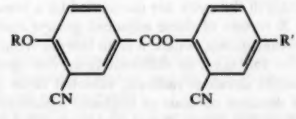
Filed Apr. 29, 1980, Ser. No. 144,809
Claims priority, application Japan, May 1, 1979, 54-53660; Jun. 11, 1979, 54-73295; Oct. 17, 1979, 54-133826
Int. Cl.[3] C07C *121/75;* C09K *3/34*
U.S. Cl. 252—299.63 15 Claims

1. An ester compound represented by the general formula



wherein each R and R' is selected from the group consisting of straight-chain alkyl groups having from one to eight carbon atoms for defining a (2'-cyano-4'-n-alkylphenyl)-3-cyano-4-n-alkoxybenzoate.

8. A liquid crystal composition comprising liquid crystal material including at least one frequency-dependent liquid crystal compound inducing a dielectric dispersion at lower frequency, admixed with at least one (2'-cyano-4'-alkylphenyl)-3-cyano-4-alkyloxbenzoate represented by the general formula:



wherein each R and R' is selected from the group consisting of straight-chain alkyl groups having from one to eight carbon atoms for increasing the absolute value of the negative dielectric anisotropy of the liquid crystal compound in the high frequency range.

4,287,086

VISCOUS ORGANIC SYSTEMS CONTAINING AN ORGANOPHILIC CLAY GELLANT WITHOUT AN ORGANIC DISPERSANT THEREFOR

Claude M. Finlayson, and John W. Jordan, both of Houston, Tex., assignors to NL Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 573,967, May 2, 1975, abandoned. This application Dec. 10, 1976, Ser. No. 749,323
Int. Cl.[3] B01J *13/00;* C10M *1/10, 5/04*
U.S. Cl. 252—316 12 Claims

1. A method of increasing the viscosity of a liquid organic system in the absence of a polar organic dispersant comprising mixing with said liquid organic system an amount sufficient to effect said viscosity increase of an organophilic clay comprising the reaction product of a methyl benzyl dialkyl ammonium compound and a smectite clay having a cation exchange capacity of at least 75 milliequivalents per 100 grams of said clay, wherein said alkyl radicals independently contain from 16 to 18 carbon atoms, and wherein the amount of said ammonium compound is sufficient to impart to the organophilic clay the enhanced dispersion characteristics desired, said amount of the ammonium compound being from 100 to less than 120 milliequivalents per 100 grams of said clay, 100% active clay basis, and from 0% to 1.0% water, wherein no polar organic dispersant for said organophilic clay is added to said organic system.

4,287,087

FIXED-DRIED BLOOD PLATELETS

Kenneth M. Brinkhous, Chapel Hill, and Marjorie S. Read, Durham, both of N.C., assignors to Research Triangle Institute, Research Triangle Park, N.C.

Division of Ser. No. 772,228, Feb. 25, 1977, Pat. No. 4,145,185. This application Aug. 2, 1978, Ser. No. 930,162
Int. Cl.[3] C09K *3/00;* G01N *33/48*
U.S. Cl. 252—408 6 Claims

1. A method for the preparation of fixed-dried blood platelets obtained from human or animal blood which comprises fixing said blood platelets and drying the fixed platelets.

4,287,088

MULTI-STAGE FLUIDIZATION AND SEGREGATION OF USED CATALYST FRACTIONS

Amalesh K. Sirkar, Lawrenceville, N.J., assignor to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Filed Aug. 21, 1979, Ser. No. 68,370
Int. Cl.[3] B01J *23/94, 21/20;* B03B *5/28, 5/66*
U.S. Cl. 252—414 6 Claims

1. A process for segregating used contaminated catalyst, comprising the steps of:

(a) introducing the used catalyst into a first compartment of a concentric walled container, said first compartment having an upper end which has a cross-sectional area of 10 to 95 percent of that of the lower end of said first compartment;

(b) fluidizing the catalyst in said first compartment with an upflowing liquid to achieve segregation of the used catalyst particles to provide a lower density less contaminated fraction at the compartment upper end, and a greater density more contaminated catalyst fraction at the compartment lower end;

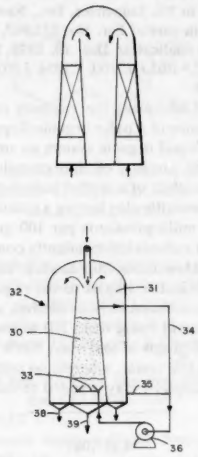
(c) further fluidizing the catalyst bed and transferring the less contaminated upper fraction over the top of the first compartment into a second compartment;

(d) withdrawing the less contaminated catalyst fraction from the second compartment; and

(e) withdrawing the more contaminated catalyst fraction from the first compartment.

2. The process of claim 1 wherein the first compartment is the outer annular space between two concentric walled containers, and the second compartment is the inner compartment.

3. The process of claim 1 in which the lower density catalyst portion transferred into the second compartment is dried



therein by a gas, prior to withdrawal of the dried catalyst therefrom.

4,287,089

METHOD FOR REMOVAL OF WATER FROM ACTIVATED CARBON

Ronald J. Convers; David P. Higley, both of Ponca City, Okla., and James A. DeBernardi, Sulphur, La., assignors to Conoco, Inc., Ponca City, Okla.

Filed Mar. 20, 1980, Ser. No. 131,979
Int. Cl.³ B01D *15/06;* **B01J** *37/00;* **C01B** *31/02*
U.S. Cl. 252—414 **10 Claims**

1. A method of removing water from activated carbon wherein the method comprises:

(a) passing about 0.2 to about 4 bed weights of liquid 1,2-dichloroethane through a bed of activated carbon, which contains from about 0.1 to about 70 weight percent water, until a bulk water phase ceases to exit the bed or until from about 60 to about 80 weight percent of the water present in a water-saturated bed has been removed, and

(b) passing vapor phase 1,2-dichloroethane through the bed of activated carbon to remove substantially all of the remaining water.

4,287,090

METHOD OF TREATING FLUE DEPOSITS AND COMPOSITION THEREFOR

William C. Pfefferle, 51 Woodland Dr., Middletown, N.J. 07748

Filed Jul. 30, 1979, Ser. No. 61,869
Int. Cl.³ B01J *31/04*
U.S. Cl. 252—428 **3 Claims**

1. An aqueous catalytic solution for removing tar deposits by spraying the solution into a firebox and its flue during or immediately following normal use of the firebox comprising a solution containing at least 10 grams of a water soluble salt of manganese and at least 5 grams of at least one additional water soluble salt selected from the group consisting of water soluble copper salts and water soluble calcium salts dissolved in a liter of water.

4,287,091

POLYMERIZATION CATALYSTS

Charles M. Selman, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.

Filed Aug. 3, 1979, Ser. No. 63,879
The portion of the term of this patent subsequent to Jan. 20, 1998, has been disclaimed.
Int. Cl.³ C08F *4/64*
U.S. Cl. 252—429 B **29 Claims**

1. A process comprising:

(a) contacting

(1) magnesium metal,

(2) an organic halide of the formula RX or $R'X_2$ where X represents a halogen, R is selected from alkynyl, alkenyl, alkyl, aryl, cycloalkenyl or cycloalkyl radicals and combinations thereof containing from 1 to 12 carbon atoms per molecule and R' is a saturated divalent aliphatic hydrocarbyl radical,

(3) titanium tetrahalide, and subjecting same to intensive milling in the absence of a complexing diluent;

(b) milling the entire reaction product of (a) with

(4) at least one of tin tetrahalide, vanadium tetrahalide and silicon tetrahalide,

(5) in the presence or absence of a triaryl phosphite, and

(c) thereafter activating the thus produced catalyst component of (b) by contacting same with

(6) an organoaluminum activator.

4,287,092

ACID CATALYSIS OF RESIN FOUNDRY BINDERS

Patrick H. Stewart, and Wayne D. Woodson, both of Danville, Ill., assignors to CL Industries, Inc., Danville, Ill.

Filed Jan. 31, 1980, Ser. No. 117,251
Int. Cl.³ B01J *31/02*
U.S. Cl. 252—429 R **6 Claims**

1. A catalyst composition for the polymerization of acid curable condensation-type resin binders in sand cores or molds, comprising

a mixture consisting essentially of an aromatic sulfonic acid and 0.5–20% wt. of perchloric acid.

4,287,093

PROCESS FOR MAKING ALPHA-OLEFIN POLYMERS OR COPOLYMERS WITH HIGH ISOTACTICITY INDEX

Marie Gilbert, Pau, France, assignor to Ato Chimie, Paris, France

Division of Ser. No. 48,172, Jun. 13, 1979, Pat. No. 4,228,253. This application Apr. 14, 1980, Ser. No. 139,874
Claims priority, application France, Jun. 21, 1978, 78 18531
Int. Cl.³ C08F *4/64*
U.S. Cl. 252—429 B **15 Claims**

1. A composition containing titanium chloride, for use in a catalyst to polymerize alpha-olefins, comprising a titanium chloride selected from the group consisting of titanium tetrachloride and titanium trichloride, and an additive consisting of a cyclic polyether of the crown ether type, in which the molecule is made up of from 0 to 20 p groups of the formula —X—C_nH_{2n}— and from 0 to 4 q groups of the formula —X—R—, with the number of p groups and q groups together being from 3 to 24, arranged in any order to form a cycle in which any two adjacent groups in the cycle are connected by a bond between the element X in one of these adjacent groups and a carbon atom in the other group, where n is an integer from 1 to 6, R, which may be the same or different from one group to the other, represents divalent radicals, selected from the group consisting of divalent radicals of aliphatic hydrocarbons containing 1 to 6 carbon atoms, divalent radicals of cycloaliphatic hydrocarbons containing 4 to 10 carbon atoms, divalent radicals of aromatic hydrocarbons containing 6 to 20 carbon atoms, and the divalent heterocyclic radicals of furane, thiophene and pyridine, in which both free valences are each borne by a carbon atom in the alpha position in relation to the hetero-

atom of these heterocycles, or by a carbon atom of an aliphatic hydrocarbon chain containing 1 to 6 carbon atoms fixed to the said carbon atom in the alpha position, X is either identical in all the groups and represents oxygen atoms, or may be different from one group to the other and represents partly oxygen atoms and partly sulphur atoms, nitrogen-containing radicals of the formula $>N—R_1$, or both, where R_1 is a hydrogen atom or alkyl radical containing 1 to 4 carbon atoms, and the number of oxygen atoms r, sulphur atoms s and nitro radicals t in the cyclic polyether molecule are such that $0 \leqq t \leqq r$, $0 \leqq s \leqq (r+t)$ and $1 \leqq r \leqq 28$.

4,287,094

MONOMERIC, POLYMERIC AND CARRIER-FIXED RHODIUM COMPLEX COMPOUNDS, PROCESS FOR THEIR PRODUCTION AND THEIR USE AS CATALYSTS

Peter Panster, Hanau; Wolfgang Buder, Rodenbach, and Peter Kleinschmit, Hanau, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 2, 1979, Ser. No. 63,291

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1978, 2834691

Int. Cl.[3] **C07F** *15/00;* **B01J** *31/12*

U.S. Cl. 252—431 R **32 Claims**

1. A complex compound of rhodium, comprised of at least one sulfide of the general formula (1)

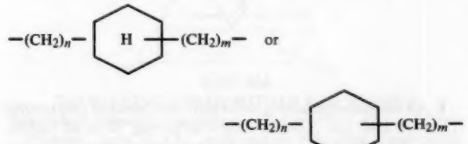
$$R_{3-x}{}^1(R^2O)_xSi—R^3—S—R^4—Si(OR^5)_yR_{3-y}{}^6 \quad (1)$$

coordinatively bound to the central atom, any free valencies are occupied by carbon monoxide, an olefin, amine, phosphine or nitrile and a required charge equalization is accomplished with chloride, bromide or iodide ion, an acetate, trifluoroacetate or trifluoro-propionate ion, complete or partial substitution of such anions by hydride ion, being optional whereby in formula (1)

each of R^1 and R^6 is a straight-chain alkyl or branched alkyl with 1 to 5 C-atoms, a cyclo-alkyl with 5 to 8 C-atoms, benzyl or phenyl, or substituted benzyl or substituted phenyl with methyl, ethyl, propyl, methoxy, ethoxy, NO_2, halide or cyanide; chloride or bromide;

R^2 and R^5 each is a straight-chain alkyl or branched alkyl with 1 to 5 C-atoms, cycloalkyl with 5 to 8 C-atoms, substituted or unsubstituted phenyl or benzyl group or the 2-methoxy or 2-ethoxy-ethyl group, whereby R^2 and R^5 have the same or a different meaning;

R^3 and R^4 each is a straight-chain alkylene or branched alkylene with 1 to 10 C-atoms a phenylene or cycloalkylene group with 5 to 8 C-atoms, unsubstituted or substituted with a methyl, ethyl, propyl or iso-propyl; or a unit of the formula



whereby n or m may be a number from 0 to 5 and H atoms in ring position may be substituted partly by halide, F, Cl, Br, or the cyanide group, and R^3 and R^4 have the same or a different meaning and

whereby x and y may be 1, 2 or 3; but also 0, whenever R^1 R^6 is equal to chlorine or bromine, and x and y have the same or a different meaning.

24. A rhodium complex compound bound by way of inorganic carriers, and showing surface-positioned oxygen atoms having the formula:

RhX_3L_3 or $RhCl(CO)L_2$,

wherein X is chloride, bromide, iodide, acetate, trifluoroacetate or trifluoropropionate and

L represents at least one ligand of the formula (1)

$$R_{d-x}{}^1(R^2O)_xSi—R^3—S—R^4—Si(OR^5)_yR_{3-y}{}^6$$

and carbon monoxide, olefin, amine, phosphine or nitrile, or crystal water bound to any free coordination places, the bond to the carrier is established by reaction of the acid hydrogen with the OR^2, OR^5, R^1 and R^2 groups present, while alcohol, phenol, HCl or HBr is distilled off, wherein any uncoordinated radicals of the sulfide are bound on the carrier and the rhodium: sulfide ratio ranges from 1:1 to $1:10^3$;

said rhodium complex being obtained from a solution of the compound RhX_3L_3 or $RhCl(CO)L_2$, which is treated within the scope of the quantitative limit ratios provided with a suspension of the carrier material in an inert organic solvent at temperatures between room temperature and the reflux temperature of the suspension agent used.

4,287,095

HIGH SURFACE AREA TRANSITION METAL CATALYSTS AND METHOD OF PREPARING SAME

Gary B. Atkinson, Reno; Larry J. Nicks, Fernley, and Donald J. Bauer, Reno, all of Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jun. 24, 1980, Ser. No. 162,542

Int. Cl.[3] **B01J** *27/22, 21/06, 23/12, 23/78*

U.S. Cl. 252—443 **5 Claims**

1. A method of preparing a catalyst which consists essentially of:

providing an alloy of nickel and at least one further metal selected from the group consisting of zirconium, hafnium, calcium and uranium;

reacting said alloy with a gas comprising H_2 and CO at a temperature of about 300° to 600° C. for a time sufficiently long to oxidize said further metal to produce a catalyst consisting essentially of said nickel and an oxide of said further metal.

4,287,096

PROCESS FOR PRODUCING SUPPORTED SKELETAL CATALYTIC MATERIALS

Gerald S. Golden; Franklin D. Lemkey, both of Windsor, and Clyde S. Brooks, Glastonbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 18, 1980, Ser. No. 131,299

Int. Cl.[3] **B01J** *21/04, 21/08, 21/12, 35/04*

U.S. Cl. 252—455 R **3 Claims**

1. A process for producing a supported skeletal catalytic material including the steps of:

a. providing a starting material which has a microstructure which includes a solid solution matrix based on a material selected from the group consisting of Al and Si, and alloys and mixtures thereof, and which contains discrete intermetallic particles of a compound between the predominant element of the matrix phase and a catalytically active metal or alloy;

b. dissolving the matrix in an aqueous caustic solution to produce a compound between the caustic material cation and the matrix material, with the evolution of hydrogen, with the reaction conditions being such that a substantial amount of excess caustic and water remain at the conclusion of the dissolution step, said dissolving process also being effective to remove at least a portion of the non-catalytic element from the intermetallic particles so as to produce skeletal catalytic particles;

c. adding an acidic material to reduce the pH of the solution

to between about 6 and about 9, with the concurrent formation of salts (based on the cation of the caustic constituent and the anion of the acidic material) and hydroxides (based on matrix material) to produce a hydroxide gel, said gel also containing the skeletal catalytic particles;

d. washing the gel to effectively remove the salt constituent;

e. drying the gel to remove the water;

f. calcining the dried gel in a reducing atmosphere to produce an oxide ceramic based on the original matrix material which contains dispersed skeletal catalytic particles.

4,287,097

CARRIER MATRIX FOR CATALYSTS AND A PROCESS FOR THE PRODUCTION OF SAME

Gerhard Fratzer; Bernhard Beck, both of Rheinfelden; Erwin Dold, Wyhlen, and Hans Klebe, Rheinfelden, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 102,581, Dec. 11, 1979. This application Feb. 29, 1980, Ser. No. 126,153

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1979, 2853547

Int. Cl.³ B01J *21/04, 23/10, 23/86, 35/04*

U.S. Cl. 252—462 **22 Claims**

1. In a carrier matrix for catalysts with cross flow effect as well as with an enlarged geometric surface, comprising layers disposed one on top of the other of highly temperature resistant and non-scaling steel, the improvement wherein the layers comprise at least one smooth screen into which at parallel distances and in the direction of the desired flow channels, closed hollow or open supporting profiles of a larger cross section than the screen are woven on or into the screen.

4,287,098

PROCESS FOR THE PRODUCTION OF EXHAUST GAS FILTERS

Frank Farnworth, and Michael H. Clubley, both of Bolton, England, assignors to Texaco Limited, London, England

Filed Feb. 26, 1980, Ser. No. 124,685

Claims priority, application United Kingdom, Feb. 28, 1979, 06972/79

Int. Cl.³ B01J *21/04*

U.S. Cl. 252—463 **19 Claims**

1. A method for the production of exhaust gas filters comprising aluminum oxide produced by the decomposition of alumina hydrate deposited on a substrate contained within a metal casing, in which said alumina hydrate is deposited from an alkali metal aluminate solution, which comprises mounting a plurality of said substrates upon a stand therefor, immersing said stand in said alkali metal aluminate solution, and subjecting said stand to vertical or horizontal reciprocating motion or rotating motion or a vector combination of said motions through said alkali metal aluminate solution whereby said alkali metal aluminate solution is caused to flow over and through said substrates while alumina hydrate is deposited on said substrates.

4,287,099

PREPARATION OF CATALYSTS FOR THE HYDROGENATION OF ACETYLENE-ALCOHOLS

Karl Baer, Weinheim; Wolfgang Reiss, Ludwigshafen; Wolfgang Schroeder, Bad Dürkheim, and Dieter Voges, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 24, 1980, Ser. No. 143,486

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1979, 2917018

Int. Cl.³ B01J *21/04, 23/72, 23/84, 23/88*

U.S. Cl. 252—465 **3 Claims**

1. A process for the preparation of a hydrogenation catalyst containing the oxides of the metals nickel, copper and molybdenum, with or without manganese, by precipitating a solution of salts of the metals with an alkali metal carbonate, filtering the resulting suspension and washing, drying and heating the filter residue, wherein an aluminum salt and/or iron salt is added to the metal salt solution, the precipitation is carried out at from 35° to 95° C. and a pH of from 5 to 9 and the heating is carried out at from 350° to 700° C., and the amount of metal salts is so chosen that, after heating, the catalyst consists of from 5 to 70 percent by weight of aluminum oxide and/or iron oxide, the remainder being principally nickel oxide and, based on nickel oxide, from 20 to 40 percent by weight of copper oxide, from 0.5 to 6 percent by weight of molybdenum oxide and from 0 to 10 percent by weight of manganese oxide.

4,287,100

1,2,3,6-TETRAHYDROBENZYL ALCOHOL ESTERS AND COMPOSITIONS CONTAINING THE SAME

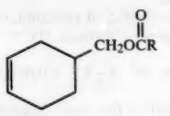
Kurt Kulka, New York; Teodosij Zazula, Rego Park, both of N.Y., and John M. Yurecko, Jr., Bayonne, N.J., assignors to Fritzsche Dodge & Olcott Inc., New York, N.Y.

Filed Mar. 14, 1978, Ser. No. 886,401

Int. Cl.³ A61K *7/46*

U.S. Cl. 252—522 R **11 Claims**

1. A fragrance composition containing 0.1–60% by weight of one or more compounds having the structure,



wherein R is hydrogen, a saturated or unsaturated aliphatic hydrocarbon group having from 1 to 6 carbon atoms and when unsaturated contains only one double bond, a phenyl group or a cyclopentyl group, and a fragrance carrier therefor.

4,287,101

ENZYME-CONTAINING DETERGENT COMPOSITION

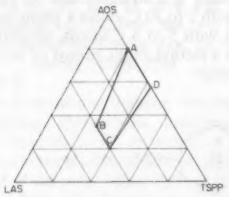
Hiroshi Nishio; Kazuaki Fukano, both of Chiba; Isao Amano, Tokyo, and Osamu Okumura, Funabashi, all of Japan, assignors to The Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1980, Ser. No. 134,453

Claims priority, application Japan, Oct. 29, 1979, 54-139478

Int. Cl.³ C11D *3/065, 3/386*

U.S. Cl. 252—537 **3 Claims**



1. An enzyme-containing detergent composition comprising (I) (a) at least one α-olefin sulfonate having 10 to 20 carbon atoms, (b) at least one anionic surface active agent having an SO_3 or SO_4 group other than said olefin sulfonate, and (c) at least one pyrophosphate selected from the group consisting of sodium pyrophosphate and potassium pyrophosphate and (II) at least one enzyme selected from the group consisting of proteases, amylases and lipases, wherein the total amount of said components (a), (b) and (c) is at least 25% by weight based on the total amount of the detergent composition and the weight ratio of (a): (b):(c) is within the area enclosed by the points A[(a):(b):(c)=80:0:20], B[(a):(b):(c)=35:40:25], C[(a):(b):(c)=20:40:40] and D[(a):(b):(c)=55:0:45], defined in the triangular diagram of the drawing.

4,287,102
DETERGENT COMPOSITION

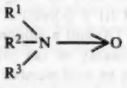
Nobuyuki Miyajima, Tokyo; Nobuo Johna, Funabashi; Naoki Mizushima, Ichikawa, and Kazuo Ohbu, Tokyo, all of Japan, assignors to The Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1980, Ser. No. 131,636
Claims priority, application Japan, Oct. 11, 1979, 54-131198
Int. Cl.³ C11D *1/14, 1/83*
U.S. Cl. 252—547 **4 Claims**

1. A detergent composition comprising:

(a) at least one water-soluble salt of olefin sulfonic acid having 12 to 16 carbon atoms and

(b) at least one tertiary amine oxide having the formula



wherein R^1 is an alkyl group of 10 to 14 carbon atoms, and R^2 and R^3 are independently an alkyl or hydroxyalkyl group of 1 to 3 carbon atoms, the content of each of said components (a) and (b) in the composition being within the range of from 2 to 20% by weight, and the mol ratio of the component (a) to the component (b) being within the range of from 1.5/1 to 0.5/1 and the pH of an aqueous solution of the detergent composition at a concentration of about 0.2% by weight being within the range of from 7.3 to 8.0.

4,287,103
JOINT COMPOSITION INCLUDING STARCH

Hubert C. Francis, Aloha, and George W. Green, Portland, both of Oreg., assignors to Georgia-Pacific Corporation, Portland, Oreg.

Filed Feb. 11, 1980, Ser. No. 120,680
Int. Cl.³ C08L *1/28*
U.S. Cl. 260—17 R **25 Claims**

1. A powdery composition capable of being combined with water to form a filler composition of the type used to hide the joint of adjoining wallboard panels, said filler composition being a wet coherent paste-like mass of fine-particle solids capable of being spread readily and drying to form a solid mass, said powdery compositions consisting essentially of filler, binder, bulking agent and improved starch-bodying agent.

4,287,104
TACKIFYING COMPOSITION FOR RUBBER

Mitchell S. Dimitri, Charleston, and Carlton G. Force, Mount Pleasant, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Jun. 4, 1980, Ser. No. 156,375
Int. Cl.³ C08L *7/00, 9/00, 21/00*
U.S. Cl. 260—17.5 **11 Claims**

1. A tackifying composition for rubber comprising an alkali lignin coprecipitated with a saponified tall oil pitch from an alkaline solution of the alkali lignin and the saponified tall oil pitch, the amount of the pitch being from about 25% to about 75% of the weight of the lignin.

9. A rubber composition comprising a raw rubber stock and from 1 part to 50 parts by weight of the tackifying composition of claim 1 per 100 parts by weight of the rubber stock.

4,287,105
FLASH RESISTANT EPOXY ENCAPSULATING COMPOSITION AND PROCESS FOR PREPARING SAME

Robert K. Rosler, Toledo; Donald B. Gore, Swanton; Malcolm N. Riddell, Perrysburg, and Earl R. Hunt, Toledo, all of Ohio, assignors to Plaskon Products, Inc., Toledo, Ohio

Filed Jan. 14, 1980, Ser. No. 112,067
Int. Cl.³ C08L *91/00*
U.S. Cl. 260—18 EP **80 Claims**

1. A process for the preparation of a flash resistant epoxy encapsulating composition comprising:

(a) blending a flash retarding composition with at least one each of an epoxy resin, a resin hardener, and a catalyst to obtain at least one resulting blend;

(b) milling each resulting blend between rolls of a differential roll mill which comprises a hot roller and a cold roller spaced between one and six millimeters apart along the lengths thereof, said rollers being rotated in opposite directions toward each other at their upper portions at different surface velocities about their respective longitudinal axes, which are approximately horizontally disposed, the surface temperature of said hot roller being near the melting temperature of said resin for a blend containing resin but at a temperature insufficient to cure said resin within the residence time of the resin on the hot roller of the mill, said mill being further supplied with a series of plows having edges, each of said plows being mounted approximately above the hot roller about a 10° to 50° angle to planes perpendicular to the longitudinal axis of said hot roller, said edges being shaped and said plows being mounted such that each of the edges are within 2 millimeters of the surface of the hot roller for a distance equal to at least 5% of the circumference of the hot roller, said plows being positioned such that each such blend introduced at a feed position of said differential roll mill is forced by said plows along said rotating hot roller to a discharge position of said differential roll mill; and

(c) when more than one blend is made, mixing said milled blends to form the encapsulating composition.

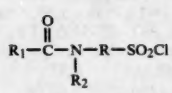
80. A flash resistant epoxy encapsulating composition comprising a blend of from about 15 to about 80 weight percent epoxy resin, from about 9 to about 82 weight percent filler, from about 0.01 to about 2 percent catalyst by weight of resin, from about 10 to about 50 percent resin hardener by weight of resin in the composition, from about 3 to about 12 percent flash retardant by combined weight of resin and hardener; and up to about 1.5 weight percent lubricant wherein the cured composition physically consists essentially of particles intimately and entirely embedded in a matrix.

4,287,106
ADHESIVE OR ADHESIVE COMPONENT CONTAINING CHLOROSULFONATED AMIDE OR IMIDE

Imre Forgo, Birsfelden; Abdul-Cader Zahir, Oberwil, both of Switzerland, and Jacques Francois, Huningue, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

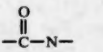
Filed Aug. 13, 1979, Ser. No. 66,355
Claims priority, application Switzerland, Aug. 16, 1978, 8693/78; Nov. 2, 1978, 11293/78; Feb. 8, 1979, 1242/79
Int. Cl.³ C08L *51/04;* **C08F** *279/02*
U.S. Cl. 260—28.5 B **15 Claims**

1. An adhesive or adhesive component containing 30 to 80 percent by weight of at least one polymerisable acrylate or methacrylate monomer and 10 to 50 percent by weight of at least one diene-containing vinyl polymer, as well as 0.05 to 10 percent by weight of a compound producing free radicals, which adhesive or adhesive component contains, as adhesion promoter, 0.1 to 15 percent by weight of an acid amide or imide which is substituted on the nitrogen atom by a chlorosulfonated alkyl, aryl or aralkyl group, and which corresponds to the formula I



(I)

in which R is an alkylene group having 1 to 25 carbon atoms, or a substituted or unsubstituted phenylene, naphthylene or phenylenealkylene group having 1 to 4 carbon atoms in the alkylene moiety, R_1 and R_2 are each hydrogen or an alkyl group having 1 to 4 carbon atoms, or R_1 and R_2 together with the



group form a heterocyclic ring which can be saturated or unsaturated and can be substituted by 1 or 2 methyl groups and which, in addition to the N atom given in the formula I, contains no further hetero atom in the ring, with the percentage values being calculated relative to the adhesive or adhesive component.

4,287,107

TRANSPARENT POLYVINYL BUTYRAL SHEET AND PROCESS FOR THE MANUFACTURE THEREOF

Hans D. Hermann, Bad Soden am Taunus, and Albrecht Harreus, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 25, 1979, Ser. No. 87,976

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1978, 2846837

Int. Cl.³ C08L *91/06;* **B32B** *17/10, 27/42*

U.S. Cl. 260—28.5 R **20 Claims**

1. An interlayer for laminated glass comprising a plasticizer-containing polyvinyl butyral, and from 0.05 to 1 weight % (relative to the plasticizer-containing polyvinyl butyral) of a montanic acid ester, wherein the ester is a diester or a triester.

9. A process for the manufacture of a an interlayer for laminated glass by thermoplastic processing of a plasticizer-containing polyvinyl butyral in the presence of an anti-blocking agent under conditions know per se, which comprises using a montanic acid diester or triester in an amount of 0.05 to 1 weight %, relative to the plasticizer-containing polyvinyl butyral, as anti-blocking agent.

4,287,108

MIXTURES OF POLYPROPYLENE AND LIQUID SATURATED DIORGANOPOLYSILOXANES

Ulrich Grigo, Krefeld; Leo Morbitzer, Cologne; Klaus-Peter Arlt, Senden; Rudolf Binsack, Krefeld, and Josef Merten, Korschenbroich, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 8, 1980, Ser. No. 119,940

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1979, 2905357

Int. Cl.³ C08L *23/12, 83/04*

U.S. Cl. 260—29.1 SB **7 Claims**

1. A homogeneous thermoplastic mixture comprising

(A) from 85 to 99.5% by weight of isotactic polypropylene having an isotactic portion of more than 90% by weight and a melt index of from 0.1 to 20 g/10 min at 230° C. under a load of 5 kg; and

(B) from 15 to 0.5% by weight of a liquid, saturated diorganopolysiloxane having a viscosity of from 30,000 to 80,000 cSt at 20° C.

4,287,109

AQUEOUS SILICONE-POLYESTER RESIN SYSTEMS, A PROCESS FOR THEIR PRODUCTION AND THEIR USE

Ottfried Schlak, Leverkusen; Hans-Heinrich Moretto, Cologne; Werner Clarenz, Leverkusen; Bernd Peltzer, Krefeld, and Willi Burgmer, Berg. Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 10, 1979, Ser. No. 65,671

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1978, 2835443; Aug. 12, 1978, 2835495

Int. Cl.³ C08L *83/06, 67/02*

U.S. Cl. 260—29.2 M **10 Claims**

1. An aqueous silicone polyester resin system having a silicone content of at least 30% by weight, based on the solid binder, comprising (a) (i) a polyester resin having an acid number of from 50 to 170 and a silicone precondensate with SiOH or SiOR-functionality or (a) (ii) a silicone-polyester-copolymer resin having an acid number of from 25 to 110; (b) based on the solid binder from 0 to 80% by weight of an organic solvent; (c) from 0 to 10% by weight, based on the solid binder, of an emulsion or dispersion auxiliary; (d) a nitrogen base; and (e) optionally at least one pigment or filler, the polyester of (a) (i) or (a) (ii) being formed by reaction of an acid selected from the group consisting of terephthalic acid, isophthalic acid, phthalic acid, pyromellitic acid or trimellitic acid or an ester or anhydride thereof with a polyhydric alcohol selected from the group consisting of ethylene glycol, butane diol, trimethylol propane, glycerine, pentaerythritol and neopentyl glycol.

4,287,110

PRODUCTION OF AQUEOUS SOLUTIONS OF CATIONIC THERMOSETTING RESINS

Hisao Takagishi, Kyoto, and Norio Kondo, Minoo, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 25, 1979, Ser. No. 78,713

Claims priority, application Japan, Jun. 7, 1978, 53-69281

Int. Cl.³ C08L *63/00*

U.S. Cl. 260—29.2 EP **10 Claims**

1. A process for producing an aqueous solution of a thermosetting resin, consisting essentially of

(i) heating an aliphatic dicarboxylic acid and a polyalkylenepolyamine to obtain a polyamidopolyamine, the molar ratio of the aliphatic dicarboxylic acid to the polyalkylenepolyamine being 1:1.0 to 1.2, and the heating being continued until the viscosity at 25° C. of a 50% aqueous solution of the resulting polyamidopolyamine reaches 400 to 1,000 cps,

(ii) reacting the polyamidopolyamine with epichlorohydrin in an aqueous medium, the amount of epichlorohydrin being 1.6 to 1.7 moles per mole of the secondary amino group present in the polyamidopolyamine, the concentration of said reactants in the aqueous medium being 15 to 50% by weight, and the reaction being continued until the viscosity at 25° C. of a 15% aqueous solution of the reaction product reaches 30 to 150 cps,

(iii) controlling the concentration of the aqueous reaction product solution to 15 to 30% by weight, and

(iv) adjusting the aqueous solution to pH 3 to 5 at 25° C.

4,287,111

COMPOSITIONS USEFUL FOR CONSOLIDATION OF MINING DEPOSITS

Jean-Philippe Rieux, Meyzieu, France, assignor to Rhone-Poulenc Industries, Paris, France

Division of Ser. No. 864,709, Dec. 27, 1977, Pat. No. 4,168,614.
This application Nov. 21, 1978, Ser. No. 962,696
Claims priority, application France, Dec. 27, 1976, 76 39802
Int. Cl.[3] C08L *33/08*
U.S. Cl. 260—29.6 RW 9 Claims

1. A composition of matter consisting essentially of (a) from about 75 to 95% by weight of an aqueous dispersion of a vinyl polymer, (b) from about 5 to 25% by weight of at least one water-soluble acrylic monomer, both percentages being based upon the total weight of the components (a) and (b), (c) a curing amount of a polymerization catalyst for the acrylic monomer (b), and (d) up to 5% by weight, based upon the weight of acrylic monomer (b), of a cross-linking monomer.

4,287,112

COATING OF POLY(ARYLENE SULFIDE), FLUOROPOLYMER AND ALUMINUM FLAKE

Jacques M. L. Berghmans, Lint, Belgium, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 10, 1980, Ser. No. 111,039
Claims priority, application PCT Int'l Appl., Nov. 16, 1979, PCT/US79/00985
Int. Cl.[3] C08L *27/12*
U.S. Cl. 260—29.6 F 9 Claims

1. A coating composition comprising, in weight percentage ranges based on the solids content, about:
(a) 95–35% poly(arylene sulfide) resin,
(b) 5–55% fluoropolymer polymerized or copolymerized from monomers selected from one or more monoethylenically unsaturated hydrocarbon monomers and hydrocarbon ether monomers, said monomers being completely substituted with fluorine atoms or a combination of fluorine atoms and chlorine atoms,
(c) 0.5–20% aluminum flake, and
(d) 0–40% titanium dioxide pigment, dispersed in liquid carrier.

4,287,113

COATING COMPOSITION

Naomitsu Takashina, Yokohama; Masahiro Shimoi, Hiratsuka, and Yoshinori Iwamoto, Odawara, all of Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan

Continuation of Ser. No. 943,794, Sep. 19, 1978, abandoned. This application Dec. 12, 1979, Ser. No. 102,920
Claims priority, application Japan, Sep. 21, 1977, 52/113743; Apr. 18, 1978, 53/45680
Int. Cl.[3] C08K *5/05*
U.S. Cl. 260—33.4 EP 3 Claims

1. An ambient temperature-curing coating composition which comprises a solution of (1) components reactive with each other to form a film upon curing at ambient temperature and (2) a solvent; said film-forming components (1) being:
(a) copolymers having pendant epoxy groups prepared by copolymerization of 2 to 60% by weight, on the basis of total monomers, of glycidyl acrylate or methacrylate or allylglycidyl ether with at least one other polymerizable monomer and
(b) 0.1 to 2 moles of phosphoric acid per one equivalent of the epoxy groups of the copolymers, and said solvent (2) being
(c) at least 5% by weight based on the weight of the solvent (2) of an alcoholic solvent and
(d) at least one other organic solvent.

4,287,114

PRIMER COMPOSITIONS

Kunio Itoh; Takeshi Fukuda, and Masaaki Matumura, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1979, Ser. No. 91,761
Claims priority, application Japan, Nov. 13, 1978, 53-139686
Int. Cl.[3] C08L *83/06;* C08K *3/36*
U.S. Cl. 260—37 SB 11 Claims

1. A primer composition which comprises
(a) 100 parts by weight of an organopolysiloxane of substantially linear molecular structure represented by the average unit formula

$$R^1_aSiO_{\frac{4-a}{2}},$$

where R^1 is a substituted or unsubstituted monovalent hydrocarbon group substantially free from aliphatic unsaturation and a is a positive number in the range from 0.98 to 2.01, and having a viscosity larger than 100,000 centistokes at 25° C.,
(b) from 5 to 100 parts by weight of a vinyl-containing organopolysiloxane represented by the average unit formula

$$R^2_bSiO_{\frac{4-b}{2}},$$

where R^2 is a substituted or unsubstituted monovalent hydrocarbon group and b is a positive number in the range from 1.9 to 2.3, from 0.03 to 1 of the groups represented by R^2 per silicon atom in a molecule being vinyl groups, and having a viscosity from 5 to 10,000 centistokes at 25° C.,
(c) from 5 to 100 parts by weight of an organopolysiloxane resin represented by the average unit formula

$$R^3_cSiO_{\frac{4-c}{2}},$$

where R^3 is a substituted or unsubstituted monovalent hydrocarbon group and c is a positive number in the range from 0.5 to 1.7,
(d) from 0.5 to 200 parts by weight of an organosilane compound represented by the general formula

$$R^4Si(OR^5)_3,$$

where R^4 is an aliphatically unsaturated monovalent hydrocarbon group and R^5 is a monovalent group selected from the class consisting of alkyl groups having 1 to 5 carbon atoms, 2-methoxyethyl and 2-ethoxyethyl groups,
(e) from 5 to 100 parts by weight of a silica filler having a specific surface area of at least 100 m^2/g,
(f) from 0 to 10 parts by weight of an organic peroxide, and
(g) from 0.5 to 50 parts by weight of a condensation catalyst.

4,287,115

FILLER MIXTURES AND THERMOSET RESINS CONTAINING SAME

Bobby Legler, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 13, 1979, Ser. No. 93,769
Int. Cl.[3] C08L *63/04*
U.S. Cl. 260—37 EP 25 Claims

1. A filler mixture comprising
(a) from about 1 to about 20 percent by weight of amorphous-pyrogenic silica and
(b) from about 80 to about 99 percent by weight of a micro or short fiber inorganic filler material.

5. A filled, curable, thermosettable resin composition con-

taining a thermosettable resin, a curing quantity of a curing system therefor and a sufficient quantity of a filler mixture so as to render the composition non-flowable and trowelable, said filler mixture comprising (a) from about 1 to about 20 percent by weight of amorphous-pyrogenic silica and (b) from about 80 to about 99 percent by weight of a micro or short fiber inorganic filler material.

4,287,116

POLYESTER URETHANE-CONTAINING MOLDING COMPOSITIONS

Joseph P. Burns, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Continuation of Ser. No. 41,369, May 22, 1979. This application Jul. 14, 1980, Ser. No. 168,707

Int. Cl.[3] C08L *67/06, 75/06*

U.S. Cl. 260—37 N **21 Claims**

1. A homogeneous solution of a vinylidene monomer and an acrylated polyester urethane resin useful in preparing injection and compression molding compositions by the reaction therewith of polyisocyanates to form polyurethane containing vinyl copolymers which comprises an ethylenically unsaturated monomer solution having dissolved therein:

(A) 30–70% by weight of a resin selected from a vinyl ester urethane having the following general formula:

c-i-(d-n)$_t$d-i-c

wherein d is a radical derived from an organic polyol; n is a radical derived from an unsaturated aliphatic dicarboxylic acid or an anhydride thereof; i is a radical derived from polyisocyanate; c is a carbamyl-linked radical derived from a hydroxy-terminated ester of acrylic or methacrylic acids; t is an integer equal to from 1 to about 5, and

(B) 1.5–30% by weight of at least one organic polyol free of ethylenic unsaturation having 2–6 hydroxyl groups per molecule and which is the essential polyurethane precursor reactive with said polyisocyanate to form polyurethane.

4,287,117

PREPARATION OF FINELY DIVIDED POLYOLEFIN MOLDING MATERIALS CONTAINING CONDUCTIVE CARBON BLACK, AND THEIR USE FOR THE PRODUCTION OF MOLDINGS

Rainer Theysohn, Ludwigshafen; Gerhard Zeitler, Hessheim; Frank Weiss, Mannheim; Hans Willing, Duerkheim, and Erhard Seiler, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 28, 1979, Ser. No. 107,905

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1979, 2901776

Int. Cl.[3] C08K *3/04*

U.S. Cl. 260—42.46 **1 Claim**

1. A process for the preparation of finely divided polyolefin molding materials which contain conductive carbon black and comprise

(a) 100 parts by weight of a finely divided partially crystalline polyolefin which has a mean particle diameter of from 10 to 5,000 μm and an intrinsic viscosity [η], measured in decalin at 130° C., of from 0.5 to 15, and

(b) from 1 to 30 parts by weight of a conductive carbon black which has a mean particle diameter of from 10 to 50 nm,

(c) with or without conventional amounts of other additives or auxiliaries,

wherein components (a) and (b), with or without (c), are mixed, in a first stage (I), in a mixer, with or without supply or removal of heat, during which first stage (I), in a first sub-stage (I.1) the mixture is brought, at a mixing intensity of from 100 to 500 W/l of useful capacity, and within a period of from 2 to 50 minutes, from ambient temperature, which is below the crystallite melting point of the polyolefin (a) and is, in particular, room temperature, to the crystallite melting point of the polyolefin (a), and is immediately thereafter, in the course of a second sub-stage (I.2), subjected to a mixing intensity which is from 0.3 to 0.8 times as great as the mixing intensity in the first sub-stage (I.1) and is brought, within a period of from 0.2 to 20 minutes, from the crystallite melting point of the polyolefin (a) to a temperature which is from 3° to 40° C. above this, and, if appropriate, is immediately thereafter, in a third sub-stage (I.3), subjected to a mixing intensity which is from 0.5 to 1.0 times as great as the mixing intensity in the second sub-stage (I.2) and kept for a period of from 0.2 to 10 minutes at the temperature reached in sub-stage (I.2), and immediately thereafter, in a second stage (II), the mixture is discharged from the mixer within a period of from 0.5 to 30 seconds and is brought, within 120 seconds, to a temperature below the crystallite melting point of the polyolefin (a).

4,287,118

ANTIMONY (V) MERCAPTIDES AS PROCESSING STABILIZERS FOR VINYL HALIDE RESINS AND METHOD OF MANUFACTURING SAME

Charles N. Muldrow, Jr., East Windsor, N.J., assignor to Associated Lead Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 936,120, Aug. 23, 1978, abandoned. This application Sep. 19, 1979, Ser. No. 77,057

Int. Cl.[3] C08K *5/59;* **C07F** *9/90*

U.S. Cl. 260—45.75 B **26 Claims**

1. A composition comprising a pentavalent antimony mercaptide having the formula

$$Sb\{S(CH_2)_K(CO)[(CH_2)_MO]_NR\}_5$$

wherein

K is 1 to 4;

M is 1 to 4;

N is 0 to 4;

R is a primary alkyl, alkenyl, alkynyl having from 1 to 18 carbon atoms and combinations thereof.

8. A composition comprising a pentavalent antimony mercaptide having the formula:

$$Sb\{S(CH_2)R\}_5$$

wherein R is a primary alkyl, alkenyl, alkynyl having from 1 to 18 carbon atoms and combinations thereof.

12. A vinyl halide resin composition comprising a pentavalent antimony mercaptide having the formula:

$$Sb\{S(CH_2)_K(CO)[(CH_2)_MO]_NR\}_5$$

wherein

K is 1 to 4;

M is 1 to 4;

N is 0 to 4;

R is primary alkyl, alkenyl, alkynyl having from 1 to 18 carbon atoms and combinations thereof.

4,287,119

3-HYDROXYALKYL PHOSPHINE OXIDE FLAME RETARDANT COMPOSITIONS

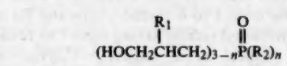
Diza P. Braksmayer, and Syed N. Hussain, both of Plainsboro, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Feb. 4, 1980, Ser. No. 118,172

Int. Cl.[3] C08K *5/53*

U.S. Cl. 260—45.95 L **24 Claims**

1. A polyphenylene oxide composition rendered flame retardant by having combined therewith an effective amount of 3-hydroxyalkyl phosphine oxide having the formula:



wherein R_1 may be the same or a different radical selected from the group consisting of hydrogen, and the methyl radical, R_2 is an alkyl radical of 4 to 8 carbon atoms and n is either zero or one.

4,287,120

DERIVATIVES OF S31794/F-1 NUCLEUS

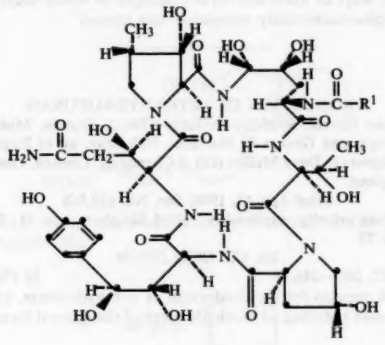
Bernard J. Abbott, Greenwood, and David S. Fukuda, Brownsburg, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 103,130, Dec. 13, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 181,445

Int. Cl.[3] **C07C** *103/52;* **A61K** *37/00;* **C12P** *21/04*

U.S. Cl. 260—112.5 R **28 Claims**

1. A compound of the formula:



wherein R^1 is C_6–C_{24} alkyl or C_6–C_{24} alkenyl, provided that when R^1 is alkyl, R^1 cannot be n-tridecyl.

4,287,121

WATER-SOLUBLE POLYFLUORO ACID AZO DYESTUFFS

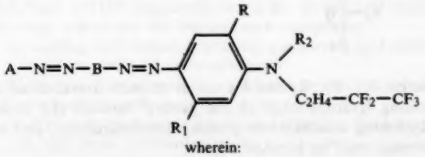
Jacques P. E. Pechmeze, Paris, and Robert F. M. Sureau, Enghien Les Bains, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Continuation-in-part of Ser. No. 428,970, Dec. 27, 1973, abandoned. This application Aug. 3, 1976, Ser. No. 711,187

Int. Cl.[3] **C09B** *29/085, 29/26, 31/043, 31/08;* **D06B** *3/24*

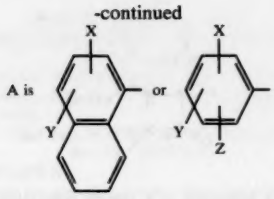
U.S. Cl. 260—186 **4 Claims**

1. A compound having the formula:



wherein:

-continued



A is or

X represents a $—SO_3H$ or PO_3H_2

Y represents hydrogen, chlorine, alkyl, alkoxy or nitro;

Z represents hydrogen;

B represents p-phenylene or 1,4-naphthylene unsubstituted or substituted by one or two alkyl or alkoxy groups;

R represents hydrogen, alkyl or alkoxy;

R_1 represents hydrogen, chlorine, alkyl, alkoxy or acetylamino; and

R_2 represents hydrogen, alkyl, cyanethyl or hydroxyalkyl, the alkyl and alkoxy having 1 to 5 carbon atoms.

4,287,122

MONOAZO COMPOUNDS FROM 1-AMINOBENZENE-2-CARBOXYLIC ACID DERIVATIVES AND THEIR USE AS COLORANTS

Klaus Hunger; Ernst Klappert, both of Kelkheim, and Konrad Löhe, Rembrücken, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

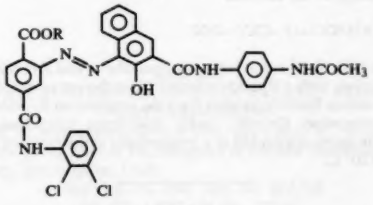
Filed Feb. 25, 1977, Ser. No. 772,268

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1976, 2607965

Int. Cl.[3] **C09B** *29/20;* **D06P** *1/44, 1/90*

U.S. Cl. 260—203 **3 Claims**

1. A compound of the formula



in which R is methyl or ethyl.

4,287,123

SYNTHESIS OF THIENAMYCIN VIA (3SR, 4RS)-3-((RS)-1-ACYLOXYETHYL)-2-OXO-4-AZETIDINEACETATE

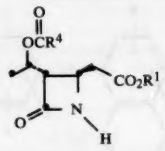
Thomas M. H. Liu, Westfield; David G. Melillo, Scotch Plains; Kenneth M. Ryan, Clark; Ichiro Shinkai, Westfield, and Meyer Sletzinger, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 14, 1980, Ser. No. 112,035

Int. Cl.[3] **C07D** *205/08, 487/04, 309/30;* **C07F** *7/10*

U.S. Cl. 260—239 A **2 Claims**

1. A compound having the structure:



wherein R^1 is hydrogen or a readily removable protecting group selected from alkyl having 1–6 carbon atoms, phenyl and aralkyl having 7–12 carbon atoms; and R^4 is selected from the group consisting of hydrogen loweralkyl having 1–6 carbon atoms, phenyl and phenylloweralkyl.

4,287,124

PROCESS FOR THE PREPARATION OF 4,5-PERFLUORO-1,3-DIOXALANES

Günter Siegemund, Hofheim am Taunus, and Herbert Muffler, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

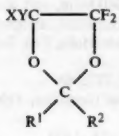
Filed Feb. 19, 1980, Ser. No. 122,691

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1979, 2906447

Int. Cl.³ C07D *317/10*

U.S. Cl. 260—340.9 R **5 Claims**

1. A process for the manufacture of 4,5-perfluoro-1,3-dioxolanes of the formula



in which X and Y, independent of one another, are fluorine or trifluoromethyl and R^1 and R^2 are hydrogen or methyl, which comprises reacting a 2-(α-chloroalkoxy)-perfluorocarboxylic acid halide of the formula

$$R^1R^2CCl—O—CXY—COZ$$

in which X, Y, R^1 and R^2 are as defined above and Z is chlorine or fluorine, with a fluoride selected from the group consisting of potassium fluoride, cesium fluoride, ammonium fluoride and alkylammonium fluoride, under anhydrous conditions, the reaction being conducted at a temperature in the range of from 0° to 120° C.

4,287,125

PREPARATION OF BENZENOID ETHERS AND THIOETHERS

Gerard Soula, Meyzieu, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Jun. 20, 1980, Ser. No. 161,512

Claims priority, application France, Jun. 27, 1979, 79 16544

Int. Cl.³ C07C *41/01, 65/21, 79/35, 121/75*

U.S. Cl. 260—340.9 R **22 Claims**

1. A process for the preparation of a benzenoid ether or thioether, comprising reacting an activated halobenzene with the anionic reactant, RA^-M^+, wherein R is a hydrocarbon, A is oxygen or sulfur, and M is alkali or alkaline earth metal, or ammonium, in the presence of at least one tertiary amine sequestering agent having the formula:

$$N\left[CHR_1—CHR_2—O\left(CHR_3—CHR_4—O\right)_nR\right]_3 \quad (I)$$

in which n is an integer which is greater than or equal to 0 and less than or equal to about 10, R_1, R_2, R_3 and R_4, which are identical or different, each represent a hydrogen atom or an alkyl radical having from 1 to 4 carbon atoms and R_5 represents an alkyl or cycloalkyl radical having from 1 to 12 carbon atoms, a phenyl radical or a radical $—C_mH_{2m}—\phi$ or $C_mH_{2m+1}—\phi—$, wherein ϕ is phenyl and in which m ranges from 1 to 12.

4,287,126

(2-OXO-2H-1-BENZOPYRAN-3-YL)AMINOOXOACETIC ACIDS AND THEIR DERIVATIVES

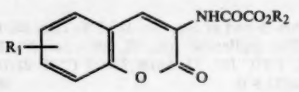
David T. Connor, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 10, 1980, Ser. No. 128,760

Int. Cl.³ C07D *311/12, 311/08*

U.S. Cl. 260—343.45 **11 Claims**

1. A compound of the formula:



I

wherein R_1 is hydrogen, halogen, hydroxy, lower alkoxy, lower alkyl or nitro and R_2 is hydrogen or lower alkyl and their pharmaceutically acceptable salts thereof.

4,287,127

PRODUCTION OF TETRAHYDROFURAN

Norman Harris, Stockton-on-Tees; Alan J. Dennis, Middlesbrough, and George E. Harrison, Billericay, all of England, assignors to Davy McKee (Oil & Chemicals) Limited, London, England

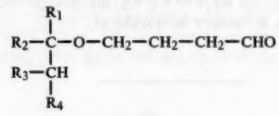
Filed Apr. 11, 1980, Ser. No. 139,568

Claims priority, application United Kingdom, Apr. 11, 1979, 12852/79

Int. Cl.³ C07D *307/08*

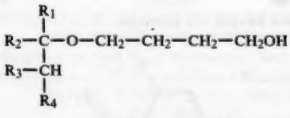
U.S. Cl. 260—346.11 **10 Claims**

1. A process for the production of tetrahydrofuran which comprises reducing an aldehyde-ether of the general formula:



(I)

wherein R_1 and R_2 each, independently of the other, represent a C_1 to C_4 alkyl radical, and R_3 and R_4 each, independently of the other, represent a hydrogen atom or a C_1 to C_3 alkyl radical, or wherein R_1 represents a C_1 to C_4 alkyl radical, R_2 and R_3 together with the carbon atoms to which they are attached form a 5-membered or 6-membered cycloaliphatic ring, and R_4 represents a hydrogen atom or a C_1 to C_3 alkyl radical to form a hydroxy ether of the general formula:



(II)

wherein R_1, R_2, R_3 and R_4 are as defined above, cleaving resulting hydroxy-ether of the general formula (II) under dehydrating conditions to produce tetrahydrofuran, and recovering resulting tetrahydrofuran.

4,287,128

PROCESS FOR PREPARING EPOXIDES

Charles T. Ratcliffe, Morristown, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 50,585, Jun. 21, 1979, abandoned. This application Apr. 18, 1980, Ser. No. 141,550

Int. Cl.[3] C07D *301/03, 273/01*

U.S. Cl. 260—348.23 3 Claims

1. A process of epoxidation of perhalo olefins of the formula $R_2C{=}CFCR_3$ wherein each R is independently fluorine and/or a C_1–C_{10} perhalogenated alkyl radical with the halogen being fluorine, chlorine or mixtures thereof, comprising: contacting said perhalo olefin with at least one member of the group consisting of the carbonates, bicarbonates and oxides of the alkali and alkaline earth metals in presence of elementary chlorine and an effective amount of moisture.

4,287,129

SYNTHESIS OF 1α-HYDROXY-7-DEHYDROSTEROIDS

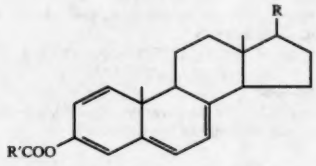
William H. Klausmeier, Elmhurst; Richard L. Johnson, Northlake, and Arnold L. Hirsch, Oak Park, all of Ill., assignors to Diamond Shamrock Corp., Dallas, Tex.

Filed Jul. 28, 1980, Ser. No. 172,925

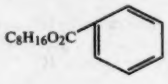
Int. Cl.[3] C07J *9/00*

U.S. Cl. 260—397.1 14 Claims

1. A steroid compound having the structure:



where R is selected from the group consisting of $C_8H_{16}OH$; $C_8H_{16}O_2CCH_3$;



and $C_5H_8O_2CH_3$ and where R'CO— is the residue of an acylating agent.

3. Methyl 3-acetoxychola-1,3,5,7-tetraen-24-oate.

4,287,130

REACTING OLEFINS WITH OZONE IN A CARBOXYLIC ACID MEDIUM

Klaus-Dieter Dohm, Haltern, and Peter Hofmann, Marl, both of Fed. Rep. of Germany, assignors to Chemische Werke Hüls A.G., Marl, Fed. Rep. of Germany

Filed Sep. 26, 1980, Ser. No. 191,270

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1979, 2942279

Int. Cl.[3] C07C *75/00*

U.S. Cl. 260—413 5 Claims

1. In a method for reacting ozone with olefins in a carboxylic acid medium in an ozonizing stage where an oxygen-containing gas is passed through an ozone production stage to produce said ozone and the oxygen-containing gas leaving said ozonizing stage is recycled, the improvement comprising:

(a) washing said oxygen-containing gas leaving said ozonizing stage with said carboxylic acid;

(b) treating the gas leaving step (a) with an aqueous solution of an alkalinically reacting substance; and

(c) drying the gas leaving step (b) and recycling the dried gas to said ozone production stage.

4,287,131

PREPARATION OF METAL ORGANOPOLYPHOSPHATE COORDINATION OF COMPLEXES

Horst G. Langer, Wayland, and Thomas P. Brady, Holliston, both of Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 28, 1980, Ser. No. 116,134

Int. Cl.[3] C07F *5/06*

U.S. Cl. 260—448 R 6 Claims

1. A process for preparing metal organopolyphosphate coordination complexes comprising contacting a metal alkoxide selected from the group consisting of the aluminum, beryllium, magnesium, zinc, barium, gallium, indium, thallium, iron, tin and titanium alkoxides of

(a) $C_{1\text{-}5}$ alkanols or haloalkanols;

(b) glycol ethers of the formula

$$HO\left(CH_2-\underset{R_1}{\underset{|}{CH}}-O\right)_nR_2$$

where R_1 is independently each occurrence hydrogen, methyl, or halomethyl; R_2 is independently $C_{1\text{-}4}$ alkyl or phenyl, and n is a number from 1 to 5; and

(c) $C_{1\text{-}10}$ alkanolamines of the formula R_3-N-$(Z)_2$ where R_3 is $C_{1\text{-}10}$ hydroxyalkyl, and Z is each occurrence hydrogen, $C_{1\text{-}3}$ alkyl or hydroxyalkyl,

with a slurry comprising a mixture of phosphorus pentoxide in an inert liquid organic medium in a ratio of alkoxy-functionality to phosphorus of 0.5:1 to 1:1, at a temperature less than 150° C.

4,287,132

PREPARATION OF POLYISOCYANATES FROM POLYCARBAMATES

Walter A. Mameniskis, Drexel Hill, and Frank W. Melpolder, Wallingford, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sep. 29, 1980, Ser. No. 191,543

Int. Cl.[3] C07C *118/00, 125/07*

U.S. Cl. 260—453 P 5 Claims

1. In the process of producing a diisocyanate comprising

(a) condensing and rearranging formaldehyde and alkyl phenylcarbamate with the alkyl having 1 to 3 carbon atoms under acidic conditions to form alkyl methylene bis(phenylcarbamate) with the alkyl having 1 to 3 carbon atoms and

(b) thermally decomposing the dialkyl methylene bis(-phenylcarbamate) to diphenylmethane diisocyanate,

the improvement comprises prior to step (b) treating the reaction product of (a) by first distilling the reaction product of (a) under reduced pressure at a temperature below 120° C. until all solvent is removed and 65 to 85% of the unreacted alkyl phenylcarbamate present is removed, discontinuing the distillation, adding a polar solvent to undistilled distillation residue and selectively crystallizing and separating dialkyl methylene bis(phenylcarbamate) from the distillation residue.

4,287,133
6-HYDROXY-2,6-DIMETHYLHEPTANAL, ORGANOLEPTIC USES THEREOF AND PROCESSES FOR PREPARING THE SAME

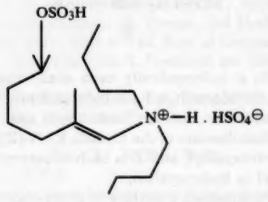
Mark A. Sprecker, Sea Bright; Robert W. Trenkle, Bricktown; Braja D. Mookherjee, Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J.; Jacob Kiwala, Brooklyn, N.Y., and Frederick L. Schmitt, Holmdel, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 088,519, Oct. 26, 1979, Pat. No. 4,242,281, which is a division of Ser. No. 052,355, Jun. 27, 1979, abandoned, which is a division of Ser. No. 961,685, Nov. 17, 1978, abandoned. This application Jul. 17, 1980, Ser. No. 169,900

Int. Cl.³ C07C *141/10*

U.S. Cl. 260—458 R **1 Claim**

1. The Shiff base having the structure:



4,287,134
PURIFICATION OF ACETONITRILE BY CAUSTIC EXTRACTION

Robert A. Smiley, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 26, 1980, Ser. No. 163,100

Int. Cl.³ C07C *121/18*; G07C *121/14*

U.S. Cl. 260—465.1 **3 Claims**

1. A process for removing water and hydrogen cyanide from a crude solution containing acetonitrile, 16–24% by weight water and 1000–20,000 ppm hydrogen cyanide which comprises thoroughly contacting 1–50 parts by volume of said crude solution with 1 part by volume based upon the volume of said crude solution of an aqueous solution consisting essentially of 25–60% by weight of an alkali metal hydroxide selected from the class consisting of sodium hydroxide, potassium hydroxide and mixtures thereof at a temperature in the range of 25°–82.5° C., permitting the thus formed mixture to form an organic and aqueous phase, and recovering the organic phase comprising acetonitrile containing essentially no hydrogen cyanide and having decreased amount of water relative to said crude solution.

4,287,135
STABILIZED DIPEROXYALKANEDIOIC ACIDS AND AROMATIC PEROXYCARBOXYLIC ACIDS

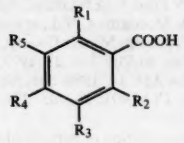
Reinhard Stober, Ludwig Uhlandstr. 7, 6451 Gross-Krotzenburg; Rolf Wirthwein, Fuerstenbergstr. 4, 6450 Hanau 9, and Christian Hase, Millrather Weg 29, 4006 Erkrath 9, all of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 954,590, Oct. 25, 1978, abandoned. This application Oct. 11, 1979, Ser. No. 83,654

Int. Cl.³ C07C *179/10*

U.S. Cl. 260—502 R **31 Claims**

1. A process for the production of a peroxy acid which is storage stable and desensitized comprising adding to the mixture resulting from the reaction of an alkanedioic acid having at least five carbon atoms or an aromatic carboxylic acid having the formula



wherein R_1, R_2, R_3, R_4 and R_5 are hydrogen, COOH, 1–4 carbon atom alkyl, 1–4 carbon atom alkoxy or halogen with hydrogen peroxide in sulfuric acid a material which reacts with sulfuric acid to form a sulfate salt as a desensitizing agent, said material being an alkali metal hydroxide, an alkaline earth metal hydroxide or sodium aluminate and being added in an amount to raise the pH to 2–6.

17. The process of claim 1 wherein there is employed the aromatic carboxylic acid.

20. The process of claim 17 wherein the added material is an aqueous solution of sodium hydroxide, aqueous slurry of magnesium hydroxide, aqueous suspension of lithium hydroxide or aqueous solution of sodium aluminate.

4,287,136
PROCESS FOR THE PREPARATION OF O,O-DIALKYLTHIONOPHOSPHORIC ACID CHLORIDES

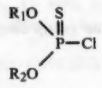
Zdenek Mazour, Lausen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 16, 1980, Ser. No. 159,884

Int. Cl.³ C07F *9/20*

U.S. Cl. 260—985 **14 Claims**

1. A process for the preparation of an O,O-dialkylthionophosphoric acid chloride of the formula I



(I)

in which R_1 and R_2 independently of one another are each an alkyl group having 1–6 carbon atoms, by reacting a dialkyl phosphite-chloride of the formula II

(II)

in which R_1 and R_2 are as defined above, with sulfur, which comprises carrying out the reaction of the dialkyl phosphite-chloride of the formula II with sulfur in an inert solvent in the presence of a catalytic amount of titanium tetrachloride.

4,287,137
VANE-TYPE FLUID IMPELLER AND METHOD OF AERATING A LIQUID

Takayasu Sonoyama, Sakai; Hiroyoshi Tani, Ibaraki, and Kobee Kobayashi, Takatsuki, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Jan. 8, 1980, Ser. No. 110,444

Claims priority, application Japan, Jan. 8, 1979, 54-5103

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—93 **22 Claims**

1. A vane-type fluid impeller for aerating a fluid by injecting a gaseous fluid therein, said gaseous fluid having gas bubbles disposed therein, comprising:

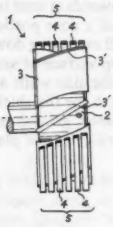
hub means having an axis of rotation, said gaseous fluid initially moving approximately parallel to said axis of rotation;

vane means connected with and arranged circumferentially around said hub means for receiving said gaseous fluid and for forcing at least a portion of said gaseous fluid to move approximately perpendicular to the axis of rotation of said hub means; and

strap means defining a grating substantially surrounding and co-rotating with said vane means for receiving said gaseous fluid from said vane means and for shearing said gas bubbles disposed within said gaseous fluid.

22. A chemical or fermentation process wherein a gas is contacted with a liquid to assist said process, comprising the steps of:

(a) introducing a gas into said liquid thereby forming a gaseous fluid having gas bubbles disposed therein; and



(b) rotating a vane-type fluid impeller in said gaseous fluid, said impeller comprising,

(1) hub means having an axis of rotation,

(2) vane means connected with and arranged circumferentially about said hub means, and

(3) strap means defining a grating substantially surrounding and co-rotating with said vane means;

(c) directing said gaseous fluid into said liquid in close proximity to said fluid impeller and to initially move substantially parallel to said axis of rotation, rotating said vane means to receive said gaseous fluid and to direct said fluid toward said strap means; and

(d) shearing said gas bubbles disposed within said gaseous fluid by means of said strap means.

4,287,138

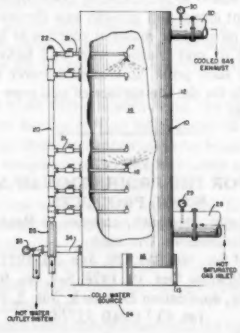
DIRECT CONTACT GASEOUS TO LIQUID HEAT EXCHANGE AND RECOVERY SYSTEM

Lynn A. Buckner, P.O. Box 3326, Burlington, N.C. 27215

Division of Ser. No. 9,172, Feb. 2, 1979. This application Mar. 5, 1980, Ser. No. 127,502

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—128 **8 Claims**



1. In a process which includes the steps of:

providing a plurality of dry cans in a drying process from which vapor-saturated gas at a first elevated temperature emanates, the improvement comprising the procedural combination of steps of:

containing said emanating vapor-saturated gas and directing said gas to an upstanding heat exchanger comprising a means for receiving said contained gas;

directly contacting said vapor saturated gas in a heat exchange zone within said heat exchanger with a relatively cooler spray of liquid, said contacting step occurring as the result of a plurality of spray heads located along a substantial length of said heat exchange zone for dispersing significant amounts of said relatively cooler liquid substantially throughout the direct contact heat exchange zone in said heat exchanger, the dispersing step providing a plurality of liquid phase droplets from a plurality of spray heads in said heat exchange zone to form a repetitive plurality of liquid phase barriers for intimate contact with said substantially saturated vapor within said heat exchange zone;

collecting relatively warm liquid resulting both from the agglomeration of sprayed relatively cool liquid and condensing of at least a portion of the saturated vapor to a receiver zone of said heat exchanger;

exhausting a gas from the heat exchanger which is relatively cool compared to the substantially saturated inlet gas; and

returning the gas exhausted from the heat exchanger to said dry cans as a supplemental source of make-up gas.

4,287,139

DEVICE FOR FORMING A NONWOVEN PRODUCT FROM A FLUID DIELECTRIC SUBSTANCE AND PROCESS

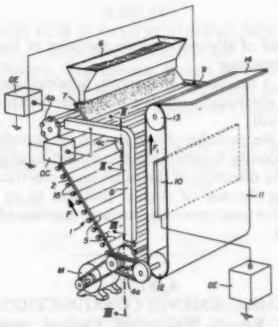
Claude Guignard, St-Genis Pouilly, France, assignor to Battelle Memorial Institute, Carouge, Switzerland

Filed Dec. 14, 1978, Ser. No. 1,254

Claims priority, application Switzerland, Dec. 22, 1977, 15840/77

Int. Cl.³ B29C *6/00*

U.S. Cl. 264—10 **10 Claims**



1. In a device for electrostatically forming filaments of a dielectric material and collecting said filaments as a nonwoven product comprising first and second spaced electrodes defining an elongated fiber-forming zone therebetween, an electrostatic generator operatively connected to one of said electrodes to establish an electrostatic field within said zone, means for supplying said dielectric material to one of said electrodes for conveyance into said zone to permit the electrostatic field within said zone to form filaments therefrom and means for collecting said electrostatically formed filaments as a nonwoven product and for continuously removing said nonwoven product from said zone, the combination wherein said first electrode comprises a plurality of discrete individual wire electrode segments extending transversely of said zone, said segments being aligned for successive movement longitudinally of said zone, said device including electrode transporting

means for sequentially moving said first electrode segments longitudinally of said zone, said transporting means being electrically insulated from said electrode segments.

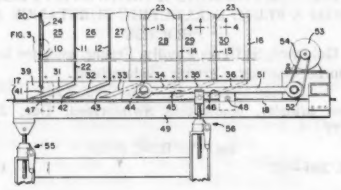
8. A process for the production of a non-woven product from a fluid dielectric substance, comprising forming a coating of the substance on a plurality of electrical conductive wires forming first electrodes stretching transversely between two endless transport bands, driving the bands synchronously to move the coated wires successively past a second electrode whose surface is relatively extensive with regard to the wires and establishing a potential difference between each wire while it passes the second electrode and the second electrode so as to create an electrostatic field which acts on the dielectric substance to form a plurality of fibers which are deposited as a non-woven web on a fiber collecting surface adjacent the second electrode.

4,287,140

METHOD FOR ORIENTATION AND DEPOSITION OF LIGNOCELLULOSIC MATERIAL IN THE MANUFACTURE OF PRESSED COMMINUTED PRODUCTS HAVING DIRECTIONAL PROPERTIES

Thomas E. Peters, and John M. Bateman, both of Boise, Id., assignors to Morrison-Knudsen Forest Products Company, Inc., Boise, Id.

Filed Dec. 26, 1979, Ser. No. 106,686
Int. Cl.³ B06B *6/60*
U.S. Cl. 264—23 **36 Claims**



1. A method of aligning discrete particles of lignocellulosic material, comprising:

depositing a multitude of discrete lignocellulosic particles onto an electrically insulative transfer surface to form a mat thereof;

subjecting the particles of said mat on the transfer surface to a directionally oriented electrical field to align the particles in the direction of the established electrical field; and

transferring the mat of aligned particles to an electrically conductive mat-receiving surface maintained at ground potential.

4,287,141

EMBANKMENTS CONSTRUCTION

Robert C. H. Russell, Wallingford, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 851,197, Nov. 14, 1977, abandoned.
This application May 1, 1979, Ser. No. 34,916
Claims priority, application United Kingdom, Nov. 22, 1976, 48607/76
Int. Cl.³ B28B *13/02*
U.S. Cl. 264—33 **15 Claims**

1. A method for constructing an embankment member or the like out of sand, comprising:

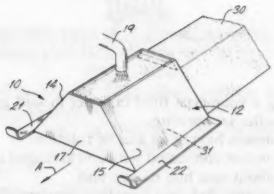
providing resting upon a surface a closed sided, closed front ended, open bottomed and open rear-ended moulding shield trailed by a doctor blade for together defining the required profile and top surface of the embankment member;

gradually moving the shield forwards on said surface along a path while filling and continuing to fill the shield with a water/sand slurry up to the effective upper extent of said closed front end, this movement being controlled to be so gradual that by the time the shield has moved forwards sufficiently to expose each new lengthwise increment of embankment member beyond said shield rear end, said each new increment has become constituted by wet sand that has settled out of said slurry up to the lower extent of said doctor blade.

7. A method for constructing an embankment upon a surface, comprising:

providing a shield having two opposed side walls which slope upwards toward one another, an upward forward end wall joining the two side walls, and a trailing rear end wall joining the two side walls in a required embankment profile, with the side walls and forward end wall extending downwards to the level of what is to be the base of the embankment and upwards at least to the level of what is to be the top surface of a core portion of the embankment and the rear end wall extending downwards to the level of what is to be the top surface of said core portion so that the upper edges of the side walls and end walls frame an upwardly open mouth for the shield;

determining a two-ended growth axis along which said embankment is to be formed and placing said shield so that



it is movably supported upon said surface at one end of said growth axis, forward end wall forwards, for movement along said growth axis to the other end thereof;

forming a hydraulic mixture of water and solid particulate material and pumping that mixture into said shield through said upwardly open mouth at such a rate that the shield becomes and remains full of said mixture, with the solid particulate material settling out of said mixture within said shield and the water tending to flow out of said shield so that said shield gradually becomes full of wet, but settled-out solid particulate material;

while continuing to perform said forming and pumping steps, guiding movement of said shield gradually forwards along said growth axis to said opposite end thereof, so that more room for said mixture within said shield is incrementally being made immediately to the rear of said forward end wall, until said opposite end is reached, the speed at which said shield so moves being controlled to assure that at each point along said growth axis the level of wet, but settled-out particulate material reaches at least up to the lower edge of said trailing rear wall before said lower edge passes such point, so that said lower edge acts as a doctor blade for the top surface of said core portion of the embankment.

4,287,142

PROCESS FOR THE PRODUCTION OF MINERAL WOOL PRODUCTS

Kjeld Holbek, Lejre, Denmark, assignor to Rockwool International A/S, Hedehusene, Denmark

Continuation of Ser. No. 811,829, Jun. 30, 1977, abandoned.
This application Oct. 19, 1978, Ser. No. 952,732
Claims priority, application Denmark, Jul. 2, 1967, 3020/67
Int. Cl.³ C04B *35/14*
U.S. Cl. 264—37 **7 Claims**

1. A process for the production of mineral wool products which comprises the steps of

(1) mixing together the following components: a finely di-

vided mineral-containing material, a hydraulic binder, an inorganic material containing at least 75% by weight of SiO_2 and being in the form of particles having an average size of less than 100 μm, and a waste material recycled from step (4),

(2) moulding the mixed components of step (1) to form briquettes,

(3) heating the briquettes of step (2) to a temperature sufficient to form a melt,

(4) spinning the melt of step (3) to form mineral wool and a waste material mainly consisting of unfiberized particles of mineral wool, and

(5) recycling said waste material of step (4) to the mixture of step (1).

4,287,143

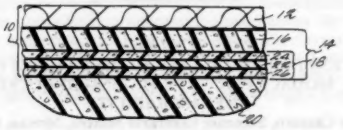
CLOTH MOLDING PROCESS

I. Weir Sears, Jr., Davenport, Iowa, and Raoul Quertain, Brussels, Belgium, assignors to Sears Manufacturing Company, Davenport, Iowa

Continuation-in-part of Ser. No. 22,592, Mar. 19, 1979. This application Oct. 10, 1979, Ser. No. 83,537

Int. Cl.³ B29D *27/04*

U.S. Cl. 264—46.8 **14 Claims**



1. A process for molding cloth comprising the steps of:

drawing the cloth into a heated mold, the cloth including a fabric layer having a fiber heat-fixable at a set temperature, and an elastic composition layer bonded to the fabric layer, the temperature of the mold being at least the heat-fixable fiber set temperature;

heating the cloth to at least the heat-fixable fiber set temperature, including the step of transferring energy from the heated mold to the cloth;

transferring the cloth into a mold having a temperature less than the fiber set temperature; and

cooling the cloth, the process heat-fixing the heat-fixable fiber of the cloth to the shape of the mold.

7. A process for forming a cloth-covered item comprising the steps of:

drawing the cloth into a heated mold, the cloth including a fabric layer having a fiber heat-fixable at a set temperature, and an elastic composition layer bonded to the fabric layer, the temperature of the mold being at least the heat-fixable fiber set temperature;

heating the cloth to at least the heat-fixable fiber set temperature, including the step of transferring energy from the heated mold to the cloth;

transferring the cloth into a mold having a temperature less than the heat-fixable fiber set temperature;

cooling the cloth; and

pouring a liquid foam composition into the mold, the process heat-fixing the heat-fixable fiber of the cloth to the shape of the mold and filling the back side of the molded cloth with foam.

4,287,144

METHOD OF MANUFACTURING CEMENTITIOUS ARTICLES AND VARIOUS FORMS OF EQUIPMENT OF PUTTING THIS METHOD INTO PRACTICE

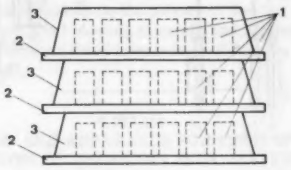
Michel Lerebourg, Marseille en Beauvaisis, France, assignor to Etablissements DEMLER S.A., Crevecoeur Le Grand (Oise), France

Filed Oct. 24, 1979, Ser. No. 88,095

Claims priority, application France, Oct. 24, 1978, 78 30240

Int. Cl.³ B28B *11/00*

U.S. Cl. 264—79 **2 Claims**



1. A method of manufacturing cementitious articles such as parpens, in which the articles are moulded on a base-plate serving for handling the articles for the curing operation, the method comprising moulding the cementitious articles on a base-plate, placing a self-supporting cover on the plate with said articles under the cover to form a curing unit, successively forming like units in the same manner, placing each successive unit on top of the preceding unit to thereby form a stack of units for the curing operation, and maintaining said stack intact during at least part of the curing period.

4,287,145

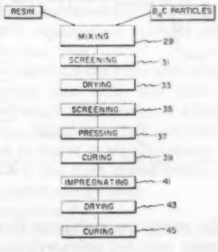
METHOD FOR MANUFACTURING NEUTRON ABSORBING ARTICLE

Carl H. McMurtry, Youngstown; Robert G. Naum, Lewiston; Dean P. Owens, and Michael T. Hortman, both of Tonawanda, all of N.Y., assignors to Kennecott Corporation, Stamford, Conn.

Division of Ser. No. 854,966, Nov. 25, 1977, Pat. No. 4,225,467. This application Mar. 24, 1980, Ser. No. 133,182

Int. Cl. *B29J 5/00*

U.S. Cl. 264—109 **12 Claims**

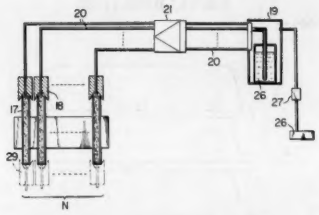


1. A method for manufacturing a neutron absorbing article which comprises mixing together a curable phenolic resin with boron carbide particles, compacting the mixture to an article of desired shape, curing the phenolic resin of the article at elevated temperature, impregnating the cured article with curable phenolic resin in liquid state and curing said article at elevated temperature.

4,287,146
NIB-TYPE WRITING PEN AND METHOD OF MANUFACTURE

Yoshio Midorikawa, 1-8-1 Nishigahara, Kita-ku, Tokyo, Japan

Filed Oct. 6, 1978, Ser. No. 949,040
Claims priority, application Japan, Oct. 11, 1977, 52-120965
Int. Cl.[3] D04H *1/64, 1/74;* B43K *1/12;* D04H *3/12*
U.S. Cl. 264—128 6 Claims



1. A method of manufacturing a writing pen having a completely integral writing nib portion and ink reservoir, comprising the steps of:

passing fibers through a die to compress and form them into a fiber bundle;

extruding a plastic sheath around said fiber bundle;

cutting the sheathed fiber bundle thus formed into a predetermined length;

injecting urethane prepolymer liquid under pressure into either or both ends of the cut and sheathed fiber bundle to impregnate same;

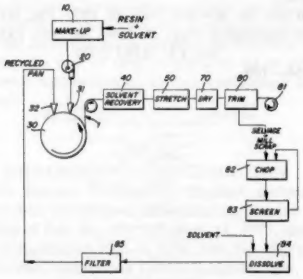
allowing the urethane polymer to harden; and

machining the impregnated end portions to a suitable shape.

4,287,147
MULTILAYER FILM MANUFACTURE UTILIZING SCRAP RESIN

Gordon P. Hungerford, Palmyra, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 25, 1980, Ser. No. 143,581
Int. Cl.[3] B29C *29/00*
U.S. Cl. 264—146 10 Claims



1. A method for producing multilayer film having at least one layer containing recycled polyacrylonitrile which comprises the steps of

co-extruding a continuous multilayer film from a first supply of substantially homogeneous polyacrylonitrile resin solution and a second supply containing non-homogeneous redissolved polyacrylonitrile resin scrap;

casting said multilayer film onto a smooth cooled drum surface to form substantially continuous adjacent layers from said first supply and said second supply;

stripping said multilayer film from said drum as a self-supporting continuous film strip;

removing at least a portion of the solvent from said multilayer film;

stretching said multilayer film to provide an oriented structure;

trimming excess polyacrylonitrile resin from said stretched film as selvage resin;

comminuting said selvage resin; and

redissolving said comminuted selvage resin in solvent for recycle to said second supply.

7. A film production system comprising

multiple die means for extruding at least two streams of resinous material in laminar flow relationship;

means for soldifiying said resinous materials to form a substantially uniform multilayered film;

means for orienting the soldified resinous materials by stretching the film;

means for drying the oriented film and removing volatile matter;

cutting means for producing a finished film product and producing resin scrap;

means for comminuting the resin scrap;

means for dissolving the resin scrap to form a non-homogeneous resin scrap material;

means for recycling the dissolved scrap material to the multiple die means for re-extrusion as a discrete layer; and

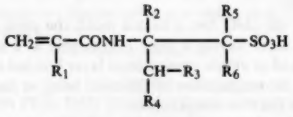
means for feeding a homogeneous resin material to said multiple die means, thereby forming contiguous layers of the non-homogeneous and homogeneous resin materials having good film integrity.

4,287,148
PROCESS FOR PRODUCING GLOSSY FIBRES OF THE MODACRYLIC TYPE HAVING REDUCED INFLAMMABILITY

Giorgio Cazzaro, Saronno; Giancarlo Matera, Monza; Antonino Cavallaro, Cesano Maderno, and Marina Zani, Saronno, all of Italy, assignors to Snia Viscosa, Milan, Italy

Division of Ser. No. 847,746, Nov. 2, 1977, Pat. No. 4,223,108.
This application Apr. 23, 1980, Ser. No. 143,100
Claims priority, application Italy, Nov. 3, 1976, 28980 A/76; Sep. 28, 1977, 27997 A/77
Int. Cl.[3] C08L *33/20, 41/00*
U.S. Cl. 264—182 10 Claims

1. A process for preparation of the modacrylic fibres having reduced inflammability and high glossiness which comprises preparing a viscous solution of a mixture of a binary copolymer A containing from 88% to 98% of monomeric units derived from acrylonitrile and from 2 to 12% of monomeric units derived from a significantly homopolymerizable sulphonic acid monomer of the formula



and salts of said acid, wherein R is hydrogen or a short chain alkyl radical and R_2, R_3, R_4, R_5, and R_6 are each hydrogen or an alkyl, cyloalkyl or aryl radical, and a binary copolymer B containing from 55% to 88% of monomeric units derived from acrylonitrile and from 12% to 45% of monomeric units derived from vinylidene chloride in a spinning solvent, and spinning said viscous solution to form fibres containing from 12% to 40% by weight of copolymer A and 88% to 60% by weight of copolymer B.

4,287,149

PROCESS FOR THE PRODUCTION OF POLYMER MATERIALS

Giancarlo Capaccio, Leeds, and Ian M. Ward, Bramhope, both of England, assignors to National Research Development Corp., London, England

Continuation of Ser. No. 782,225, Mar. 28, 1977, abandoned, which is a continuation of Ser. No. 562,043, Mar. 26, 1975, abandoned, and a continuation-in-part of Ser. No. 508,879, Sep. 24, 1974, abandoned. This application Sep. 19, 1978, Ser. No. 943,857

Claims priority, application United Kingdom, Oct. 3, 1973, 46141/74; Mar. 5, 1974, 9796/74

Int. Cl.[3] D01D *5/12*

U.S. Cl. 264—210.7 15 Claims

1. A process for the production of a high modulus polymer material which comprises quenching a crystallizable polymer selected from the group consisting of high density polyethylene, ethylene copolymers containing at least 95% by weight of ethylene, and polyoxymethylene having a weight average molecular weight (Mw) of less than 300,000 and a ratio of Mw to number average molecular weight (Mn) less than 30 from a temperature at or above its melting point to a temperature at or close to its crystallization temperature; maintaining the polymer at the temperature for a time sufficient to allow crystallization to occur; and then attenuating the polymer at a temperature below its melting point at a rate such that the deformation ratio (the ratio of the final length to the initial length) is at least 15.

4,287,150

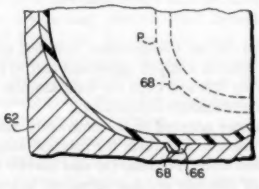
METHOD AND APPARATUS FOR INJECTION BLOW MOLDING AN ARTICLE WITH IMPROVED DETAIL DEFINITION

Aime J. Gendron, Rehoboth, Mass., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 40,891, May 21, 1979. This application Jan. 23, 1980, Ser. No. 114,623

Int. Cl.[3] B29C *17/07*

U.S. Cl. 264—538 8 Claims



1. A method of molding an article with molding detail of high definition in an injection blow molding machine having an injection mold and cooperating blow mold comprising:

providing in the molding cavity of the injection mold features recessed below the surrounding cavity wall and defining molding detail finer than that obtainable in the blow mold under preselected blowing pressures and temperatures;

injecting settable material into the injection mold cavity at injection pressures and temperatures sufficiently elevated to force the settable material into the recessed features of the mold cavity and thereby produce a parison having the features of finer molding detail raised thereon;

transferring the parison with the molding features thereon from the cavity of the injection mold to the cavity of the blow mold;

blowing the parison in the cavity of the blow mold under the preselected blowing pressures and temperatures to form an article having the general shape defined by the blow mold cavity; and

during the step of blowing preserving the features of finer molding detail raised on the parison by limiting the level of the preselected blowing pressures and temperatures to prevent the raised detail from being deformed by the blow cavity wall.

4,287,151

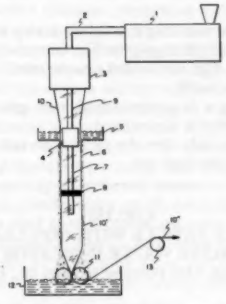
METHOD AND APPARATUS FOR HIGH SPEED EXTRUSION OF THERMOPLASTIC MATERIALS

Michael D. Esakov, Greer; David C. Hudgens, Jr., Lyman, and Frederick D. Stringer, Greenville, all of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Filed Dec. 13, 1976, Ser. No. 749,861

Int. Cl.[3] B29F *3/08*

U.S. Cl. 264—560 17 Claims



1. In the process of extruding thermoplastic materials in tubular form without expanding the tubular extrudate radially to a diameter greater than that of the extruder die the improvement which comprises:

(a) disposing support means within said extruded tube, said support means being of larger diameter than said tube at the point of its contact therewith and having a passageway therethrough to equalize air pressure above and below said support means; and,

(b) cooling and solidifying the inner wall of said tube prior to contact between said wall and said support means whereby the contact of said support means and tube wall causes the unsolidified extrudate upstream from said support means to be stable at high extrusion rates.

10. Apparatus for the high speed production of tubular thermoplastic extrudate comprising:

(a) a circular extrusion die;

(b) means for delivering molten thermoplastic material to said die;

(c) interior cooling means located below said die for solidifying the interior wall of said extrudate while not in direct contact therewith, said interior cooling means having a diameter smaller than the tubular extrudate; and,

(d) support means located below said interior cooling means and having an air pressure equalization passageway therethrough, said support means having a diameter greater than that of the tubular extrudate at the point of contact

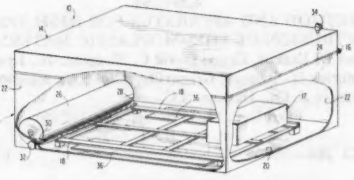
therewith but less than the diameter of the extrusion die and being in contact with the inner periphery of said tubular extrudate thereby causing the unsolidified extrudate upstream of said support means to be stable under high speed operation.

4,287,152

METHOD OF FOR RETARDING DYE FADING DURING ARCHIVAL STORAGE OF DEVELOPED COLOR PHOTOGRAPHIC FILM

Richard B. Hoover, and Charles M. Rhodes, both of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 7, 1980, Ser. No. 119,340
Int. Cl.³ B01J *19/14, 19/00*
U.S. Cl. 422—40 **6 Claims**



1. A method for retarding dye fading during archival storage of developed color photographic film comprising the steps of:
(a) placing the film in a sealed opaque vault;
(b) venting the vault;
(c) introducing a dry, pressurized inert gas into the vault while the latter is vented; and
(d) sealing the vault after the air in the vault is purged and replaced by the inert gas.

4,287,153

DISPOSABLE ARTICLE WITH NON-LEACHABLE SALINE WATER INDICATOR

Marvin S. Towsend, 1365 Potomac Heights Dr., Oxon Hill, Md. 20022

Continuation-in-part of Ser. No. 943,960, Sep. 20, 1978, abandoned. This application Nov. 30, 1979, Ser. No. 98,914
Int. Cl.³ G01N *33/52;* **A61F** *13/00, 13/16*
U.S. Cl. 422—56 **37 Claims**

1. A disposable article for absorbing bodily excretions, comprising:
a quantity of absorbent material for absorbing the bodily excretions;
a semitransparent water impermeable backsheet for retaining said absorbent material and the absorbed excretions; and
a quantity of non-leachable saline water indicating material placed in contact with said absorbent material and in close proximity to said semitransparent backsheet for indicating the presence of the absorbed excretions.

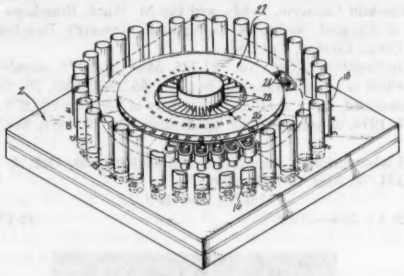
4,287,154

SPECIMEN TRANSFER RACK

Philip B. Sommers, 923 Garden Rd., Orange, Conn. 06477

Filed May 7, 1980, Ser. No. 147,616
Int. Cl.³ G01N *21/01, 1/10*
U.S. Cl. 422—64 **7 Claims**

1. A specimen transfer rack for use in transferring fluid specimens from a plurality of bulk specimen tubes to a plurality of specimen receptacles carried on a part of a specimen analyzing instrument, said rack comprising:
(a) support means for releasably holding and supporting the part of the specimen analyzing instrument; and
(b) a plurality of specimen tube holders equiangularly disposed about said support means whereby each of said tube holders is disposed opposite to and paired with a respective one of the specimen receptacles on the part of the specimen analyzing instrument.

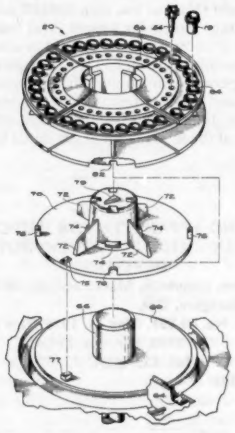


4,287,155

SAMPLE TRAY AND CARRIER FOR CHEMICAL ANALYZER

Glenn E. Tersteeg, Honeoye Falls, and Richard R. Harold, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 16, 1980, Ser. No. 159,554
Int. Cl.³ G01N *35/04*
U.S. Cl. 422—64 **3 Claims**



1. A tray and carrier combination, adapted to be rotatably mounted on chemical analysis apparatus and to receive a plurality of metering tips and cups for fluid samples for chemical analysis; said combination comprising:
a circular carrier adapted to be removably mounted on the chemical analysis apparatus for rotation about an axis;
a tray adapted to be mounted on said carrier and having a plurality of discrete arcuate segments independently removable from and replaceable onto said carrier about said axis;
a plurality of angularly spaced first discontinuities on each of said segments, each of said first discontinuities being adapted to receive a fluid sample cup; and
a plurality of second discontinuities on each of said segments for receiving a plurality of metering tips, each of said second discontinuities being associated with a different one of said first discontinuities, whereby one of said segments can be removed from said carrier for restocking

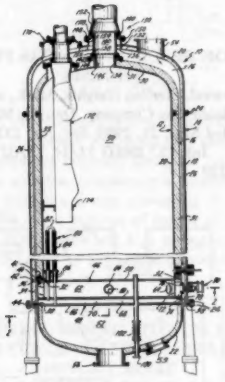
with fresh metering tips and fluid sample cups while the analysis apparatus continues to operate on the fluid samples in cups on segments retained on said carrier and whereby said carrier and all the segments may be removed from the analysis apparatus as a unit.

4,287,156

FLUIDIZED BED REACTOR

Angelo De Feo, Totowa Boro, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed May 19, 1980, Ser. No. 151,385
Int. Cl.³ B01J *8/08;* **F27B** *15/08, 15/10, 15/16*
U.S. Cl. 422—143 **15 Claims**



1. In a fluidized bed reactor having inner and outer spaced shells to define therebetween a gaseous fluid inlet passageway for receiving and conducting a gaseous fluid from a source thereof remote from the reactor, a distribution partition having a fluid distributing means to divide the inner shell into a reaction zone and an outlet chamber, a heat exchanger in the reaction zone for conducting gaseous fluid therethrough for the absorption of heat from the reaction zone, inlet connector means for passing particulate materials into the reaction zone for reaction with said gaseous fluid, and outlet connector means for passing products of the reaction from the reaction zone, the improvement comprising

(a) partition means cooperating with the distribution partition to form first and second inlet manifolds;

(b) said first manifold being in communication with said inlet passageway to receive one portion of gaseous fluid therefrom for passage into the reaction zone through said fluid distributing means;

(c) said second manifold being in communication with said inlet passageway to receive from the latter another portion of said gaseous fluid for passage into said heat exchanger; and

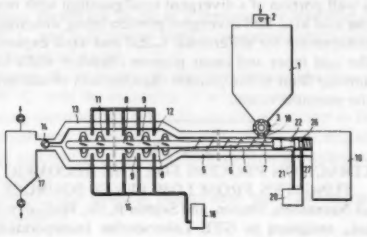
(d) valve means within the reactor for modulating the flow of gaseous fluid from said inlet passageway to said first manifold and said second manifold.

4,287,157

COAL HYDROGENATING APPARATUS HAVING MEANS FOR SEALING THE ROTARY DRIVE THEREOF

Klaus Koch, Laatzen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed May 21, 1980, Ser. No. 151,762
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943538
Int. Cl.³ B01J *3/03, 4/00, 8/10;* **C10G** *1/06*
U.S. Cl. 422—205 **10 Claims**



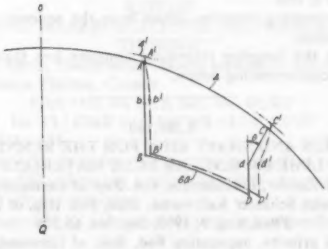
1. Apparatus for hydrogenating coal with hydrogen to form hydrocarbons and for sealing the drive-end of a preparation and hydrogenation chamber comprising a chamber, a hollow cylinder defining said chamber, a rotatable element contained in said chamber to convey particles of coal from a preparation portion of said chamber into and through a hydrogenation portion of said chamber, a sealing region at the drive-side of said rotatable element, said sealing region comprising a conical annular gap formed between the wall of said hollow cylinder and said rotatable element adjacent an aperture for feeding the coal into said preparation portion of said chamber, said conical annular gap tapering towards said preparation portion of said chamber, a first annular space on the drive-side of said conical annular gap, a feed passage communicating said first annular space with a storage container and means for recirculating a sealing substance in paste form from said storage container, under pressure, through said feed passage into said first annular space.

4,287,158

SUPPORT SYSTEM FOR INTERNAL STRUCTURE IN A HIGH TEMPERATURE VESSEL

Philip S. Roots, Godalming, England, assignor to Van Tongeren U.K. Limited, Godalming, England

Filed Apr. 28, 1980, Ser. No. 144,569
Int. Cl.³ B01J *8/18;* **F26B** *17/10*
U.S. Cl. 422—241 **8 Claims**



1. A pressure vessel having a vertical axis of symmetry; and further including:

(a) a ceiling of non-horizontal form to said pressure vessel;

(b) means defining an annular plenum chamber within the

pressure vessel, adjacent said ceiling, said annular plenum chamber comprising an annular floor having inner and outer perimeters, inner and outer walls symmetrical about said axis of the pressure vessel, means joining said inner wall to the inner perimeter of said floor and to said ceiling, and means joining said outer wall to the outer perimeter of said floor and to said ceiling;

(c) a plurality of cyclone separators and

(d) means suspending said cyclone separators from the annular floor of said plenum chamber wherein

(e) at least one of said radially inner wall and said radially outer wall of the plenum chamber includes means defining a wall portion of a divergent configuration with respect to the said axis, said divergent portion being dimensioned to compensate for differential radial and axial expansions of the said inner and outer plenum chamber walls and said annular floor of the plenum chamber and of said ceiling of the pressure vessel.

4,287,159

EXTRACTION PROCESS FOR THE RECOVERY OF TUNGSTEN FROM LOW LEVEL SOURCES

Samuel Natansohn, Sharon, and Sophia R. Su, Wellesley, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 59,803, Jul. 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 18,488, Mar. 8, 1979, abandoned. This application Sep. 15, 1980, Ser. No. 186,948

Int. Cl.³ C01G *41/00*

U.S. Cl. 423—54 **13 Claims**

1. A process for recovering tungsten substantially free of contaminating boron from aqueous media containing tungsten and boron comprising the steps of:

(a) adjusting the pH of said aqueous medium to a value below about pH 8;

(b) contacting the pH-adjusted aqueous medium with an ion exchange resin to load the resin with tungsten and boron values from said aqueous medium;

(c) eluting the loaded resin with an aqueous eluant solution to selectively recover a portion of the tungsten from said loaded resin;

(d) adjusting the pH of the tungsten-containing aqueous eluate solution to a value below about pH 3;

(e) contacting the pH-adjusted aqueous eluate solution with an organic extractant solution comprising o-mercaptobenzoic acid, a quaternary alkylammonium salt, and an inert organic solvent to transfer a portion of the tungsten values to the organic extractant solution;

(f) contacting the tungsten-containing organic extractant solution with an aqueous stripping solution to transfer a portion of the tungsten values to said aqueous stripping solution and to regenerate said organic extractant solution;

(g) recycling the regenerated organic extractant solution to step e; and

(h) recovering tungsten values from the aqueous stripping solution,

whereby the tungsten recovered contains less than 1 mole percent contaminating boron.

4,287,160

PROCESS AND SHAFT KILN FOR THE BURNING OF LIME OR SIMILAR BULK MATERIALS

Hans von Zander, Balduinstein, Fed. Rep. of Germany, assignor to Johann Schaefer Kalkwerke, Diez, Fed. Rep. of Germany

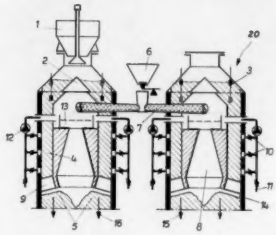
Filed Aug. 9, 1979, Ser. No. 65,208

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1978, 2834862

Int. Cl.³ C01F *1/00*

U.S. Cl. 423—168 **4 Claims**

1. Process for the burning of lime, cement or another similarly burnable lumpy bulk material in a shaft kiln using coal, which comprises continuously feeding coal dust or dry coal into a gasification chamber positioned in the center of the shaft kiln, partially or fully gasifying the coal dust or dry coal therein by the addition of air in substoichiochiometric propor-



tions, mixing the resultant partially or fully gasified fuel with air at an elevated temperature, and then burning the mixture in the burning zone of the shaft kiln, the flow of the burnt fuel, that is, heating medium, and the flow of the kiln charge being cocurrent within the kiln.

4,287,161

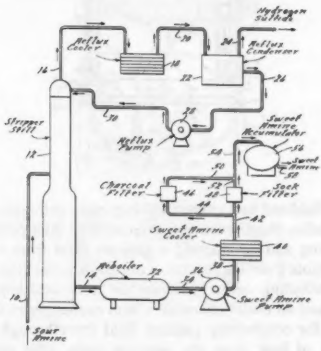
METHOD FOR DEFOAMING IN GAS PURIFICATION SYSTEMS

Jagdish M. Agrawal, Sterling Heights, Mich., assignor to Michigan Consolidated Gas Company, Detroit, Mich.

Filed Mar. 21, 1980, Ser. No. 132,685

Int. Cl.³ B01D *53/34, 19/02*

U.S. Cl. 423—229 **2 Claims**



1. In a method for purifying a gaseous mixture by removing contaminants therefrom with an aqueous ethanolamine scrubbing solution, the method of defoaming and regenerating the scrubbing solution comprising the steps of sequentially:

(a) separating gaseous contaminants from said scrubbing solution by passing said scrubbing solution through a stripper still;

(b) cooling said scrubbing solution;

(c) dividing said scrubbing solution into a major stream and a minor stream, said minor stream comprising from about 10% to about 20% of flow by volume of said scrubbing solution;

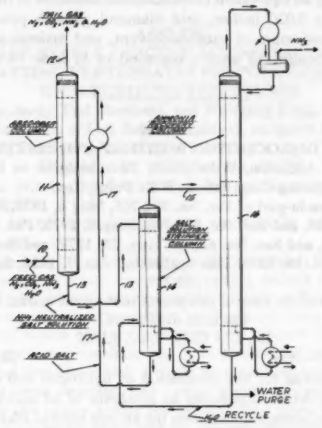
(d) passing said minor stream through an activated charcoal filter; and

(e) combining said minor stream and said major stream to provide a regenerated scrubbing solution.

4,287,162
SEPARATION OF AMMONIA FROM AMMONIA CONTAINING GASES

Edward G. Scheibel, Media, Pa., assignor to Suntech, Inc., Philadelphia, Pa.

Filed Jul. 18, 1979, Ser. No. 58,695
Int. Cl.³ C01C *3/00*
U.S. Cl. 423—238 **3 Claims**



1. A process for the recovery of ammonia from its admixture with gases which comprises scrubbing said ammonia containing gas at a temperature between about 50° to about 115° C. with an aqueous solution containing a mixture of different cations selected from the group consisting of ammonia and alkali metal cations and a mixture of anions of phosphate and borate, wherein said anions are at a concentration of from about 80% to about 90% of saturation concentration.

4,287,163
PROCESS FOR RECOVERING LITHIUM FROM BRINE BY SALTING OUT LITHIUM SULFATE MONOHYDRATE

Donald E. Garrett, Ojai, Calif., and Martin Laborde, New York, N.Y., assignors to Saline Processors, Inc., Ojai, Calif. and Corporacion de Fomento de la Produccion, Santiago, Chile

Filed May 29, 1979, Ser. No. 43,136
Int. Cl.³ B01D *9/02;* **C01B** *35/00, 35/14;* **C01D** *15/06*
U.S. Cl. 423—283 **17 Claims**

1. A process for recovering lithium values from sulfate-containing brines having a lithium ion concentration of at least 0.4 weight percent and at least about 30 moles $MgCl_2$ per 1000 moles H_2O comprising adding to said brines a soluble sulfate salt and recovering therefrom lithium sulfate monohydrate.

4,287,164
PROCESS FOR PRODUCING CUBIC SYSTEM BORON NITRIDE

Tadashi Endo; Osamu Fukunaga, both of Sakura, and Minoru Iwata, Matsudo, all of Japan, assignors to National Institute for Researches in Inorganic Materials, Ibaraki, Japan

Filed Oct. 12, 1979, Ser. No. 84,162
Claims priority, application Japan, Oct. 23, 1978, 53-130292
Int. Cl.³ C01B *21/064*
U.S. Cl. 423—290 **7 Claims**

1. A process for producing cubic system boron nitride which comprises contacting calcium or strontium boron nitride with hexagonal system boron nitride and heating at higher than 1,450° C. under the thermodynamically stable pressure for cubic system boron nitride.

4,287,165
PREPARATION OF HIGH PURITY PHOSPHORUS

Arthur F. Rupp, Oak Ridge, and David V. Woo, Knoxville, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 831,194, Sep. 7, 1977, abandoned. This application Apr. 4, 1980, Ser. No. 137,096
Int. Cl.³ C01B *25/01, 25/02, 25/04, 25/10*
U.S. Cl. 423—323 **3 Claims**

1. A method for preparing phosphorus by the steps comprising:

reducing $Pb_3(PO_4)_2$ in H_2 at a temperature less than about 500° C. and sufficient to form a reaction product upon the evolution of water;

continuing the reduction at said temperature less than about 500° C. until the evolution of water ceases;

reducing the resulting water-free reaction product in H_2 at a temperature in the range of 600°–800° C. to decompose said reaction product and form gaseous phosphorus; and thereafter

condensing the gaseous phosphorus and recovering said phosphorus.

4,287,166
ZEOLITE ZSM-39

Francis G. Dwyer, West Chester, Pa., and Edwin E. Jenkins, Woodstown, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 84,683, Oct. 15, 1979, abandoned. This application Jun. 6, 1980, Ser. No. 156,905
Int. Cl.³ C01B *33/20, 33/28;* **C07F** *7/02*
U.S. Cl. 423—325 **8 Claims**

1. A porous zeolite having a composition, expressed in terms of moles of anhydrous oxides, per 100 moles of silica, as follows:

$(0–2.5)M_{2/n}O$: $(0–2.5)Al_2O_3$: $(100)SiO_2$

wherein M is at least one cation having a valence n, and wherein said zeolite is characterized by a characteristic X-ray diffraction pattern as set forth in Table 1 of the specification.

4,287,167
NOVEL HARZBURGITE AND PREPARATION THEREOF

Pierre C. Aitcin, Sherbrooke, Canada, assignor to Universite de Sherbrooke, Quebec, Canada

Filed Oct. 26, 1979, Ser. No. 88,352
Int. Cl.³ C01B *33/24;* **C04B** *35/04, 35/20*
U.S. Cl. 423—331 **8 Claims**

1. Process for preparing harzburgite having Fe_2O_3 content of less than 5% and having a ratio MgO/SiO_2 of from between 1.0 to 1.3 which comprises:

(a) demagnetizing a magnetite-containing serpentinite by a dry process;

(b) recovering the demagnetized serpentinite fraction;

(c) calcining said demagnetized fraction thereby to transform the demagnetized serpentinite to an harzburgite having a Fe_2O_3 content of less than 5% and a ratio MgO/SiO_2 of from between 1.0 to 1.3.

4,287,168

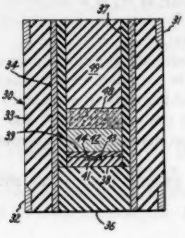
APPARATUS AND METHOD FOR ISOLATION OF DIAMOND SEEDS FOR GROWING DIAMONDS

Robert H. Wentorf, Jr., Schenectady, and William A. Rocco, Scotia, both of N.Y., assignors to General Electric Company, Worthington, Ohio

Continuation of Ser. No. 544,497, Jan. 27, 1975, abandoned, which is a continuation of Ser. No. 412,331, Nov. 2, 1973, abandoned. This application Nov. 22, 1976, Ser. No. 744,169

Int. Cl.³ C01B *31/06*

U.S. Cl. 423—446 **18 Claims**



1. In a diamond synthesis reaction vessel for introduction into the reaction volume of a high pressure, high temperature apparatus, said reaction vessel constituting an assembly of interfitting elements for enclosing diamond seed material and a source of substantially pure carbon, said diamond seed material and said source of carbon being separated by a mass of metallic catalyst-solvent material for the diamond-making reaction disposed therebetween so as to provide a pre-determined temperature gradient between said diamond seed material and said source of carbon under operating conditions of pressure and temperature above the graphite-to-diamond equilibrium line on the phase diagram of carbon, said diamond seed material and said source of carbon being located in separate regions of said reaction vessel such that under said operating conditions said diamond seed material will be heated to a temperature near the minimum value of temperature for said temperature gradient and simultaneously said source of carbon will be heated to a temperature near the maximum value of temperature for said temperature gradient, the combination with said interfitting elements of

(a) a solid barrier separating said diamond seed material from the mass of catalyst-solvent material, said barrier being inert to, and insoluble in, the molten catalyst-solvent material and

(b) at least one restricted diamond growth path extending through said barrier and interconnecting said mass of catalyst-solvent material and a volume containing said diamond seed material, said growth path having a maximum cross-sectional area equivalent to a circular area having a diameter of 0.020 inches.

11. A process for the production of diamond material comprising the steps of: pressurizing a reaction vessel containing a diamond seed material and a source of carbon separated by a mass of catalyst-solvent to a pressure in the diamond stable region of the phase diagram of carbon said seed material, carbon source and catalyst-solvent being positioned in stacked relationship within said reaction vessel; while simultaneously heating said reaction vessel in such a manner to create within said vessel a temperature gradient in said diamond stable region such that the diamond seed material is at a temperature near the minimum temperature of said gradient and said source of carbon is at a temperature near the maximum temperature of said gradient, whereby a temperature gradient is created between said seed material and carbon source; and limiting diamond growth adjacent the diamond seed material until the catalyst-solvent material is saturated with carbon under the operating conditions and until a diamond growth pattern is initiated upon said seed material and established in said carbon saturated mass of catalyst-solvent by interposing an isolation barrier in the reaction vessel between said diamond seed material and said mass of catalyst-solvent prior to said pressurizing and heating step, said isolation barrier being substantially inert to the reaction vessel and its contents at said operating conditions and has at least one opening therein between said diamond seed material and said mass of catalyst-solvent at said operating conditions to define a restricted diamond growth path having an equivalent cross-sectional diameter in the range of 0.001 to 0.020 inches, said diamond growth proceeding freely in said mass of catalyst-solvent, and maintaining said operating conditions until a diamond of at least 14 mgm is grown.

4,287,169

WATER DISSOCIATION METHOD AND MATERIAL

Eugene R. Anderson, Wills Point, Tex., assignor to Horizon Manufacturing Corporation, Wills Point, Tex.

Continuation-in-part of Ser. No. 902,705, May 4, 1978, Pat. No. 4,207,095, and Ser. No. 902,708, May 4, 1978, Pat. No. 4,182,748, and Ser. No. 68,749, Aug. 23, 1979, and Ser. No. 85,374, Oct. 16, 1979. This application Jan. 7, 1980, Ser. No. 110,217

The portion of the term of this patent subsequent to Jan. 8, 1997, has been disclaimed.

Int. Cl.³ C01B *1/07, 13/02*

U.S. Cl. 423—579 **28 Claims**

1. A material for the generation of hydrogen and oxygen from water which comprises an amalgam of an alkali metal, mercury and aluminum wherein the atomic ratio of alkali metal to mercury is from about 3:1 to about 1:1.5 and the atomic weight ratio of alkali metal to aluminum is from about 1:1 to about 3:1 combined with an alloy of a metal selected from the platinum metals family and at least one element selected from the group consisting of germanium, antimony, gallium, thallium, indium, cadmium, bismuth, lead, zinc and tin.

14. A process for the generation of hydrogen and oxygen from water which comprises contacting water with an amalgam of an alkali metal, mercury and aluminum wherein the atomic ratio of alkali metal to mercury is from about 3:1 to about 1:1.5 and the atomic weight ratio of alkali metal to aluminum is from about 1:1 to about 3:1 combined with an alloy containing a metal selected from the platinum metal family.

4,287,170

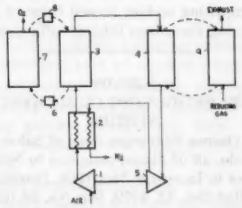
NITROGEN AND OXYGEN VIA CHEMICAL AIR SEPARATION

Donald C. Erickson, 1704 S. Harbor La., Annapolis, Md. 21401

Filed Mar. 6, 1980, Ser. No. 127,728

Int. Cl.³ C01B *13/00*

U.S. Cl. 423—579 **9 Claims**



9. A continuous process for the production of nitrogen substantially free of oxygen from a nitrogen and oxygen containing gas comprising:

a. contacting the gas with an oxygen acceptor so as to remove between 60% and 95% of the oxygen from the gas;

b. contacting the oxygen depleted gas from step (a) with an

oxygen scavenger so as to remove substantially all remaining oxygen and to generate heat;
c. indirectly transferring said heat to said nitrogen and oxygen containing gas,
d. regenerating the oxidized scavenger by reduction with a reducing gas and recycling it to additional oxygen depleted gas contact;
e. regenerating and recycling the scceptor to additional gas contact.

4,287,171

STORAGE STABLE QUICKLY ACTING TABLETS FOR COMBATTING VERTEBRATES PREPONDERANTLY IN UNDERGROUND STRUCTURES

Angelika Jordy, Bad Homburg, and Wolfgang Kapp, Offenbach am Main, both of Fed. Rep. of Germany, assignors to Degesch GmbH, Frankfurt, Fed. Rep. of Germany

Filed May 11, 1979, Ser. No. 38,226

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1978, 2825534

Int. Cl.[3] **A01M** *13/00;* **B65D** *75/26;* **A01N** *59/26;* **A01M** *25/00*

U.S. Cl. 424—29 **5 Claims**

1. A process for combatting vertebrate animals living in an underground structure having an opening therein comprising providing a packaged storage stable, quickly acting tablet for combatting said vertebrates, said package consisting essentially of a tablet which consists essentially of a mixture of commercial magnesium phosphide and a mold assistant located in a cavity in a first film which is water vapor and air impermeable, tear and break resistant, said cavity having an open top, and covering the cavity across the open surface thereof a second film which is water vapor and air impermeable, non-tear resistant and non-break resistant, the two films being sealed together at their edges tightly against water vapor and airs so that water vapor and air cannot reach the tablet in the cavity, breaking the tablet and the non-tear resistant, non-break resistant second film without touching the magnesium phosphide and introducing the package with the broken film and tablet into the opening of the underground structure in order to gas the underground structure.

4,287,172

COSMETIC COMPOSITIONS FOR THE HAIR AND THE SKIN, BASED ON POLYMERS WHICH CONTAIN AMINO GROUPS AND RECURRING UNITS HAVING A CYCLIC STRUCTURE

Bernard Jacquet, Antony; Christos Papantoniou, Montmorency, and Jean Mondet, Sevran, all of France, assignors to L'Oreal, Paris, France

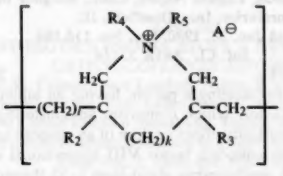
Filed Sep. 20, 1978, Ser. No. 944,140

Claims priority, application Luxembourg, Sep. 23, 1977, 78170

Int. Cl.[3] **A61K** *7/06, 31/74*

U.S. Cl. 424—47 **9 Claims**

1. A cosmetic composition to improve the suppleness and sheen of the hair and to facilitate the hydration and softness of the skin comprising in a cosmetic vehicle suitable for application to the hair or skin from 0.01 to 15% by weight of a polymer comprising recurring units of the formula



(Ib)

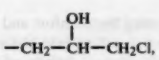
wherein

k is O or 1, and l is 1 if k=O, or is O if K=1, R_2 and R_3 each independently represent hydrogen or methyl,

R_4 represents a radical selected from the group consisting of hydrogen, $-(CH_2)_m-CH_3$ wherein m is 0-21, $-(CH_2)_q-OC_2H_5$ wherein q is 1 or 2, and $-CH_2COOR_6$ wherein R_6 represents alkyl having 1-3 carbon atoms and R_5 represents a radical selected from the group consisting of

(1) $-(CH_2)_q-OC_2H_5$ wherein q is 1 or 2,

(2) $-CH_2-COOR_6$ wherein R_6 has the meaning given above,

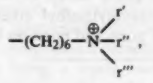


(3)

(4) $-(CH_2)_n-CN$ wherein n is 1 or 2,

(5) $-CH_2-CH=CH_2$,

(6) $-CH_2-CH_2-O-CH=CH_2$, and



(7)

$A'^{\oplus}$ wherein r', r'', and r''' each independently represent alkyl having 1-4 carbon atoms, and A and A' each independently represent Cl, Br, I or $-OSO_3CH_3$, said polymer hav[illegible] a molecular weight ranging from 2,000 to 500,000.

4,287,173

VACCINE FOR DENTAL CARIES

Dennis J. Carlo, Middlesex; Jesse J. Jackson, Marlboro, and Thomas H. Stoudt, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 24, 1979, Ser. No. 77,971

Int. Cl.[3] **A61K** *7/16, 39/00, 31/70*

U.S. Cl. 424—49 **8 Claims**

1. A method of reducing the incidence of dental caries in a susceptible mammalian species comprising administering an effective amount of a capsular polysaccharide of *S. pneumoniae* type 4, 12 or 19.

6. An anti-caries composition consisting essentially of at least two capsular polysaccharides of *S. pneumoniae* types 4, 12 or 19 in an anti-caries effective amount in a physiologically acceptable medium, the total amount of capsular polysaccharide in the anti-caries composition not exceeding about 100μg per type and a pharmaceutically acceptable topical carrier.

4,287,174

ANTI-ULCER COMPOSITION

Robert G. Laughlin, Cincinnati, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 892,242, Mar. 31, 1978, abandoned. This application Mar. 1, 1979, Ser. No. 16,655

Int. Cl.[3] **A61K** *33/12, 33/10, 33/08, 31/205*

U.S. Cl. 424—78 **16 Claims**

1. A composition of matter for oral administration comprising:

(a) a safe and effective amount of a conventional antacid; and

(b) a zwitterionic compound selected from the group consisting of

$n\text{-}C_{12}H_{25}N^+(CH_3)_2(CH_2)_5CO_2^-$,

$n\text{-}C_{14}H_{29}N^+(CH_3)_2\text{-}(CH_2)_5CO_2^-$,

$n\text{-}C_{16}H_{33}N^+(CH_3)_2(CH_2)_5CO_2^-$,

$n\text{-}C_{18}H_{37}N^+(CH_3)_2(CH_2)_5CO_2^-$,

$n\text{-}C_{20}H_{41}N^+(CH_3)_2(CH_2)_5CO_2^-$, and

$n\text{-}C_{22}H_{45}N^+(CH_3)_2(CH_2)_5CO_2^-$, and esters and salts thereof in an amounts which is safe and effective for preventing or relieving ulceration of the gastric mucosa.

4,287,175
CONTACT LENS WETTING AGENTS

Irving M. Katz, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 918,121, Jun. 22, 1978, abandoned, which is a continuation of Ser. No. 600,167, Jul. 29, 1975, abandoned. This application Jun. 1, 1979, Ser. No. 44,620

Int. Cl.³ A61K *31/70, 31/74, 31/78, 47/00*

U.S. Cl. 424—78 **5 Claims**

1. A method for improving the comfort and wearing time of contact lenses comprising inserting into the eye of a contact lens wearer an insert consisting essentially of a solid polymer which is soluble in lacrimal fluids having a surface area of from about 5 to about 800 sq. mm., a length of from about 1–30 mm. and a width of height of from about 0.25 mm. to about 30 mm., said polymer being selected from the group consisting of cellulose derivatives, natural gums, starch derivatives, dextrose, polyalkylene glycols, polyvinylmethyl ethers, polyethylene oxide, acrylates, xanthan gums and mixtures thereof.

4,287,176
ANTHELMINTIC LEVAMISOLE AND TETRAMISOLE GEL COMPOSITIONS

Richard J. Demchak, Langhorne, Pa., and Vito Corso, Jr., New Providence, N.J., assignors to American Cyanamid Co., Stamford, Conn.

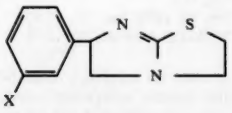
Filed Oct. 9, 1980, Ser. No. 195,532

Int. Cl.³ A61K *31/74, 31/425*

U.S. Cl. 424—78 **11 Claims**

1. An aqueous composition comprising: 3% to 15% by weight of a pharmaceutically acceptable salt of the anthelmintic compound of the formula:

(dl)



wherein X is hydrogen or —NH—R; R is C_2–C_5 alkanoyl or benzoyl; or the optical isomers thereof; 30% to 50% by weight of water; 1.5% by weight of citric acid; 1.0% by weight of trisodium citrate acid; 14% to 25% by weight of propylene glycol; and 20% to 30% by weight of the gellant α-hydro-Ω-hydroxy-poly(oxyethylene)poly(oxypropylene)poly(oxyethylene) block copolymer, average molecular weight 12,500, specific gravity 1.05; mp 56° C., viscosity 3100 at 77° C.; wherein said compositions are gels in the temperature range of from −20° C. to +60° C.; with the provisos that the water/gellant ratio is from 1.4/1.0 to 2.0/1.0; and that the components of said composition add up to a total of 100% by weight.

4,287,177
WOUND COVERING MATERIAL

Toshihide Nakashima, Kurashiki; Osamu Nakaji, Sakura; Koichi Takakura, Okayama, and Takayoshi Suzuki, Suita, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki and Yamanouchi Pharmaceutical Co., Ltd., Tokyo, both of, Japan

Filed Aug. 15, 1979, Ser. No. 66,699

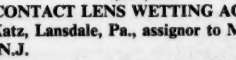
Claims priority, application Japan, Aug. 18, 1978, 53-101267

Int. Cl.³ A61K *31/78*

U.S. Cl. 424—81 **18 Claims**

1. A protective covering material for forming a film or coat on skin and/or wound surfaces consisting essentially of a hydrophillic, water-insoluble and substantially uncrosslinked polymer in powder form (component A), polyethylene glycol (component B) and an aqueous liquid (component C),

wherein said polymer of component A is derived from a monomer represented by the formula:



wherein R^1 is H or methyl, R^2 is alkylene containing 2–5 carbon atoms, R^3 is H, alkyl containing 1–3 carbon atoms or C_2- or C_3-alkyl substituted by amino or alkoxy of 1–3 carbon atoms and n is 1–30, at least 67% by weight of said polymer being composed of said monomer,

wherein said component A amounts to 20–80% by weight of components A+B+C,

said components B+C together amount to 80–20% by weight of components A+B+C, and

said components C amounts to 20–70% by weight of components B+C.

4,287,178
FELINE RHINOTRACHEITIS VACCINE AND PRODUCTION AND USE THEREOF

James L. Bittle, Doylestown, Pa., assignor to Pitman-Moore, Inc., Washington Crossing, N.J.

Continuation of Ser. No. 454,345, Mar. 25, 1974, abandoned. This application Nov. 2, 1979, Ser. No. 90,849

Int. Cl.³ A61K *39/12, 39/265*

U.S. Cl. 424—89 **20 Claims**

1. A process of attenuating virulent feline viral rhinotracheitis virus which comprises propagating said virus for at least 7 two- to seven-day serial passages through feline tissue cultures in a nutrient fluid at an incubation temperature of about 30°±2° C.

4,287,179
IMMERSION VACCINE FOR ENTERIC REDMOUTH

Donald F. Amend, Lynnwood, Wash., assignor to Tavolek Inc., Redmond, Wash.

Continuation-in-part of Ser. No. 938,604, Aug. 31, 1978, abandoned. This application Jan. 10, 1980, Ser. No. 111,142

Int. Cl.³ A61K *39/02*

U.S. Cl. 424—92 **4 Claims**

1. A method for the immunization of fish weighing at least about one gram against Enteric Redmouth which consists essentially of the non-pressurized immersion without hyperosmotic treatment of the fish in a vaccine comprising an immunologically effective amount of the killed organism *Y. ruckeri* for a period of time sufficient to confer immunity to the fish.

4,287,180
METHOD FOR TREATING BLOOD CLOTTING FACTOR INHIBITORS

William R. Thomas, Laguna Niguel, Calif., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jan. 28, 1980, Ser. No. 116,186

Int. Cl.³ A61K *35/14*

U.S. Cl. 424—101 **5 Claims**

1. A method for treating a patient having an inhibitor of a blood clotting factor, which comprises administering to the patient a therapeutically effective dose of an aqueous composition including, in units/ml, factor VIII correctional activity, about from 2–35; prothrombin, about from 1–10; thrombin, less than about 0.003; factor VII, about from 37–190; factor VIIa, about from 8–80; factor IX, about from 15–112; factor IX precursor, 0 to about 30; factor X, about from 1–30; and factor Xa, about from 1–10.

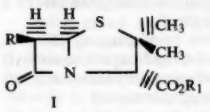
4,287,181

DERIVATIVES OF 6β-HYDROXYALKYLPENICILLANIC ACIDS AS β-LACTAMASE INHIBITORS

Michael S. Kellogg, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

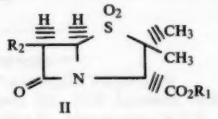
Filed Oct. 22, 1979, Ser. No. 86,864
Int. Cl.[3] C07D 499/00
U.S. Cl. 424—114 37 Claims

1. A compound selected from the formulae



I

and



II

or pharmaceutically acceptable base salt thereof, wherein R is 1-hydroxy-3-phenylpropyl; R_1 is selected from the group consisting of benzyl, hydrogen and ester-forming residues readily hydrolyzable in vivo; R_2 is

wherein R_3 is selected from the group consisting of sulfo, hydrogen, alkoxycarbonyl having from two to four carbon atoms, alkanoyl having from two to eighteen carbon atoms, benzoyl, substituted benzoyl wherein said substituent is selected from the group consisting of amino, methyl, methoxy, fluoro, chloro, bromo and trifluoromethyl, alkylsulfonyl having from one to four carbon atoms, phenylsulfonyl and substituted phenylsulfonyl wherein said substituent is selected from the group consisting of methyl, methoxy, fluoro, chloro, bromo and trifluoromethyl; and R_4 is selected from the group consisting of hydrogen, alkyl having one to four carbon atoms, phenyl, pyridyl, benzyl and β-phenethyl.

4,287,182

ANTIBIOTICS PRODUCED BY A NEW MICROBE, *CATENULOPLANES JAPONICUS*

Walter D. Celmer, New London; Walter P. Cullen, East Lyme; Liang H. Huang, East Lyme; John R. Oscarson, Pawcatuck, all of Conn.; Riichiro Shibakawa, Handa, and Junsuke Tone, Chita, both of Japan, assignors to Pfizer Inc., New York, N.Y.

Filed Jul. 2, 1980, Ser. No. 165,407
Int. Cl.[3] A61K 35/00
U.S. Cl. 424—118 9 Claims

1. The antibiotic CP-54,715 which is soluble in methanol and chloroform; insoluble in heptane; has an elemental analysis of C, 49.62%; H, 6.16%; N, 1.04%; and Cl, 5.16%; a decomposition point of 166°-176° C.; an $[\alpha]_D^{20}$ rotation of −8° in methanol; a UV max at 289 nm with an extinction coefficient of 29 at 1% concentration in methanol and an IR spectrum as a suspension in a KBr pellet as shown in FIG. 1.

4,287,183

METHOD OF KILLING RODENTS

John D. Hagerman, and Brenda M. Hagerman, both of 1641 Lancing Dr., Apt. # 269, Salem, Va. 24153

Filed Nov. 5, 1979, Ser. No. 91,653
Int. Cl.[3] A61K 33/08
U.S. Cl. 424—157 2 Claims

1. A process for exterminating rodents comprising placing in locations frequented by rodents a rodenticide composition comprised of a substantially dry homogeneous mixture of a first ingredient comprising a carbohydrate, protein, or fat, said first ingredient being a water insoluble comestible solid of natural origin and in the form of a powder capable of passing through a 100 mesh sieve, and a second ingredient comprising a water-insoluble inorganic cementitious powder selected from the group consisting of Portland cement, plaster of paris and calcium oxide, said second ingredient being capable of passing through a 200 mesh screen and capable of reacting with water to undergo hydration with attendant formation of a coherent aggregate structure, said first and second ingredients comprising between about 20% and 60% by volume of said composition.

4,287,184

PROCESS FOR HEALING WOUNDS

David M. Young, Sherborn, Mass., assignor to The Massachusetts General Hospital, Boston, Mass.

Continuation-in-part of Ser. No. 854,194, Nov. 23, 1977, Pat. No. 4,185,095. This application Sep. 19, 1979, Ser. No. 76,998
Int. Cl.[3] A61K 35/37, 37/00
U.S. Cl. 424—177 4 Claims

1. The process for accelerating healing of an animal wound which comprises administering to the wound a nerve growth factor having a molecular weight of about 116,000, said composition being derived from mouse submandibular gland or from mouse saliva which composition is free from the components of mouse saliva or mouse gland which degrade the nerve growth factor in an amount effective to accelerate wound healing, said composition being obtained by dissolving either mouse submandibular or mouse saliva in an aqueous salt solution, and passing said salt solution a plurality of times through a chromatographic column comprising a positively charged ion exchange resin and recovering a fraction of said salt solution rich in a composition having nerve growth factor activity and having a molecular weight of about 116,000.

4,287,185

METHOD FOR THE DETECTION OF VIRUSES

Kumao Toyoshima, Suita; Akira Hakura, Toyonaka; Toshihiro Nakanishi, Ibaraki, and Hajime Yoshizumi, Takatsuki, all of Japan, assignors to Suntory Ltd., Osaka, Japan

Filed Oct. 9, 1979, Ser. No. 82,657
Claims priority, application Japan, Oct. 9, 1978, 53-124412
Int. Cl.[3] A61K 37/00; C07C 103/52
U.S. Cl. 424—177 9 Claims

1. A method for the quantitative detection of viruses comprising the steps of:

(a) contacting a virus infected cell culture with a polypeptide having the following formula:

wherein the symbols "Ala", "Arg", "Asn", "Cys", "Gln", "Gly", "Leu", "Lys", "Phe", "Pro", "Ser", "Thr", "Tyr" and "Val" indicate, respectively, the residues of the levo rotatory forms of alanine, arginine, asparagine, ½ cystine, glutamine, glycine, leucine, lysine, phenylalanine, proline, serine, threonine, tyrosine and valine, and wherein R_1–R_5 indicate (1) the residues of the L-amino acids lysine, asparagine, leucine, threonine and aspartic acid, respectively, or (2) wherein R_1 is arginine, R_2 and R_5 are glycine, R_3 is isoleucine and R_4 is serine, respectively, the symbols " " represent —S—S— bonds and the arabic numerals included in the structural formula near certain amino acid residues constitute the sequence number of said amino acids in turn from the N-terminal and physiologically acceptable salts thereof, said polypeptide and salts thereof being present in an amount sufficient to selectively kill virus infected cells;

(b) incubating said virus infected cell culture for a period for time sufficient to selectively kill cells infected with said virus; and

(c) measuring the number of cells in said cell culture which are killed by said virus.

4,287,186

ANTIBIOTICS, A PROCESS FOR THEIR PREPARATION AND THEIR USE AS PLANT PROTECTION AGENTS

Hans Zähner, Tuebingen; Hartwig Holst, Pohlheim; Gerhard Zoebelein, Leverkusen, and Adelinde Keckeisen, Tuebingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 21, 1979, Ser. No. 106,223

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1979, 2900591

Int. Cl.[3] **A61K** *31/71*

U.S. Cl. 424—181 **4 Claims**

1. A method of combating arthropods, comprising applying to the arthropods an arthropodicidally effective amount of an antibiotic which (a) is colorless, very readily soluble in water and in pyridine but insoluble in other customary organic solvents, gives a positive reaction with ninhydrin, sodium metaperiodate/benzidine and potassium permanganate and gives a yellow coloration with iron (III) chloride, (b) has the UV and IR spectra substantially as shown in FIGS. 1 and 2, (c) on chemical degradation yields uracil, an amino-hexuronic acid and an amino-acid containing a pyridine ring, (d) on paper electrophoresis proves to be an amphoteric substance and has an isoelectric point at about pH 6 and (e) consists of the elements carbon, hydrogen, oxygen and nitrogen, or one or more active components of the antibiotic mixture, the active agent being applied alone or in admixture with a diluent or carrier.

4,287,187

METHOD FOR TREATING TUMORS WITH CIS-DIAMMINEPLATINUM(II) ORTHOPHOSPHATE COMPLEXES

James D. Hoeschele, Oakridge, Tenn., assignor to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Division of Ser. No. 17,994, Mar. 7, 1979. This application Dec. 26, 1979, Ser. No. 106,436

Int. Cl.[3] **A61K** *31/685, 31/28*

U.S. Cl. 424—199 **4 Claims**

1. A method for treating malignant S180 ascites or lymphocytic leukemia P388 tumors in a mammal afflicted therewith which comprises administering to said mammal an effective amount of a cis-diammineplatinum(II) orthophosphate complex useful in the treatment of tumors, said complex comprising cis-$\{Pt(NH_3)_2\}$ and an orthophosphate moiety of the formula: $\{(H_{2-n}PO_4)\}^{-(1+n)}$ wherein n is 0 or 1 and the atomic ratio of phosphorous to platinum is about 0.5–1 or about 1—1.

4,287,188

PURINE DERIVATIVES

Howard J. Schaeffer, Raleigh, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 771,778, Feb. 24, 1977, abandoned, which is a continuation-in-part of Ser. No. 608,263, Aug. 27, 1975, abandoned, and Ser. No. 662,900, Mar. 1, 1976, Pat. No. 4,199,574, and Ser. No. 718,105, Aug. 27, 1976, abandoned. This application Jun. 29, 1978, Ser. No. 920,625

The portion of the term of this patent subsequent to Apr. 22, 1997, has been disclaimed.

Int. Cl.[3] **A61K** *31/52;* **C07D** *473/18*

U.S. Cl. 424—200 **53 Claims**

1. 9-(2-hydroxyethoxymethyl) guanine monophosphate or a pharmaceutically acceptable salt thereof.

7. A pharmaceutical composition comprising an effective non-toxic antiviral amount of 9-(2-hydroxyethoxymethyl) guanine monophosphate or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier.

4,287,189

O,S-DIALKYL O-OXYSULFONYLPHENYL PHOSPHOROTHIOLATES AND PHOSPHORODITHIOATES

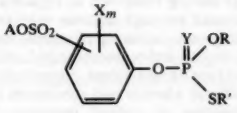
William S. Hurt, Collegeville, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 680,330, Apr. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 587,510, Jun. 16, 1975, abandoned. This application Mar. 24, 1980, Ser. No. 133,219

Int. Cl.[3] **C07D** *143/68;* **A61K** *31/66*

U.S. Cl. 424—210 **17 Claims**

1. A compound of the formula:



wherein

R is a (C_1–C_4) alkyl group;

R′ is a (C_3–C_6) alkyl group;

Y is an oxygen atom or a sulfur atom;

X is a halogen atom, a (C_1–C_5) alkyl group, or a (C_1–C_5) alkoxy group;

m is an integer from 0 to 3; and

A is

(a) a (C_1–C_5) alkyl group substituted with up to three halogen atoms;

(b) a (C_5–C_6) cycloalkyl group;

(c) a (C_7–C_{10}) aralkyl group, the aryl portion of which is

optionally substituted with up to three halogen atoms, nitro groups, cyano groups, (C_1–C_5) alkyl groups, (C_1–C_5) alkoxy groups or (C_1–C_5) alkylthio groups; or

(d) an aryl group of the formula:

wherein

X' is a halogen atom, a nitro group, a cyano group, a (C_1–C_5) alkyl group, a (C_1–C_5) alkoxy group or a (C_1–C_5) alkylthio group, and

m' is an integer from 0 to 3

14. A method of controlling pests which comprises applying directly to the pests or to the loci to be freed of or protected from attack by such pests, a pesticidally effective amount of the compound of claim **1**.

4,287,190

COMPLEXES OF BIVALENT COPPER

Barry Boettcher, 12 Mahogany Dr., New Lambton, N.S.W.; William R. Walker, 36 Stanley St., Merewether, N.S.W., and Michael W. Whitehouse, Dept. of Experimental Pathology, Australian National University, Canberra, A.C.T., all of Australia

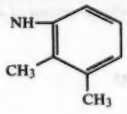
Continuation-in-part of Ser. No. 963,755, Nov. 27, 1978, abandoned. This application Nov. 29, 1979, Ser. No. 98,344

Claims priority, application Australia, Aug. 15, 1979, PE0041

Int. Cl.[3] **A61K** *31/60*

U.S. Cl. 424—230 **19 Claims**

1. A topical anti-inflammatory therapeutic composition comprising an anti-inflammatory effective amount of a neutral copper complex of the formula $Cu[C_6H_4(X)COO]_2Y$ wherein Y represents dimethylsulfoxide, dimethylformamide or an alkanol, and wherein X can be located in any position and is OH, SH, SeH, NH_2 or



and a pharmaceutically acceptable non-aqueous carrier.

4,287,191

NOVEL SALICYLANILIDES AND MICROBIOCIDAL COMPOSITIONS AND USES THEREOF

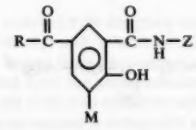
Robert A. Coburn, Williamsville; Richard T. Evans, East Amherst; Robert J. Genco, Amherst, all of N.Y., and Armando Batista, Parque Lefevre, Panama, assignors to The Research Foundation of State University of New York, Albany, N.Y.

Filed Apr. 14, 1980, Ser. No. 140,098

Int. Cl.[3] **A01N** *37/36;* **C07C** *101/74, 119/02*

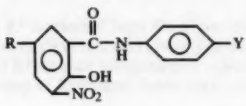
U.S. Cl. 424—230 **37 Claims**

1. A compound having the formula:



where Z is substituted phenyl ring of from 6 to 30 carbon atoms including substituents, R is a substituted or unsubstituted alkyl or phenyl group of from 2 to 30 carbon atoms including substituents and M is a radical selected from the group consisting of —C≡N, —F, —NO_2, —H, lower alkyl and lower haloalkyl, said composition having a partition coefficient greater than 4 and the substituted moieties in the phenyl ring of the Z group having a combined overall electron withdrawing effect on the phenyl ring of the Z group.

27. A compound of the formula:



where R is $CH_3(CH_2)_8C$— and Y is —NO_2.

4,287,192

ANTIGLAUCOMA AGENTS

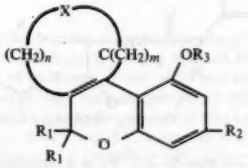
Anthony T. Dren, Waukegan, and Barbara A. Bopp, Lake Bluff, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 948,058, Oct. 2, 1978, Pat. No. 4,217,351, which is a division of Ser. No. 711,749, Aug. 4, 1976, Pat. No. 4,136,183. This application Jan. 17, 1980, Ser. No. 112,988

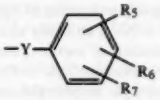
Int. Cl.[3] **A61K** *27/00, 31/54, 31/495, 31/445*

U.S. Cl. 424—248.51 **1 Claim**

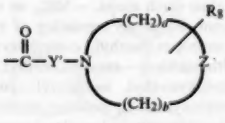
1. A method of reducing intra-ocular pressure in mammalian patients comprising administering to a glaucoma patient a therapeutic effective amount of a compound of the formula



wherein, in the C ring, X is S, n is an integer of 0 to 3 and m is an integer of 0 to 3; each R_1 is loweralkyl and when taken together the substituents R_1R_1 form oxygen; R_2 is a C_1–C_{20} straight or branched chain alkyl, cycloalkyl, or



wherein Y is a straight or branched chain alkylene group having from 1 to 10 carbon atoms, and each R_5, R_6 and R_7 are the same or different members selected from the group consisting of H, halo and loweralkyl; R_3 is



wherein Y' is a straight or branched chain alkylene group having 1 to 8 carbon atoms, a is an integer from 1 to 4, b is an integer from 1 to 4, Z is CH_2, O, S or NR_9 where R_9 is H or loweralkyl, with the provision that when Z is O, S or NR_9, the

sum of a and b is 3 or 4, and R_8 is H or loweralkyl; and the pharmaceutically acceptable salts thereof.

4,287,193

SYN ISOMERS OF 7-[2-(2-AMINO-4-THIAZOLYL)-2-(CARBOXYMETHYLOXYIMINO)-ACETAMIDO]-CEPH-3-EME-4-CARBOXYLIC ACID COMPOUNDS

Rene Heymes, Romainville, and Andre Lutz, Strasbourg, both of France, assignors to Roussel Uclaf, Paris, France

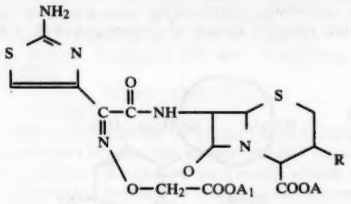
Filed Apr. 3, 1979, Ser. No. 26,767

Claims priority, application France, Apr. 7, 1978, 78 10387

Int. Cl.³ A61K *31/545*; C07D *501/56*

U.S. Cl. 424—246 **10 Claims**

1. A compound selected from the group consisting of syn isomers of 7-[2-(2-amino-4-thiazolyl)-2-(carboxymethyloxyimino)-acetamido]-ceph-3-eme-4-carboxylic acid compounds of the formula



wherein R is $—CH_2—S—R_1$, R_1 is a heterocyclic selected from the group consisting of 1-methyl-tetrazolyl, 2-methyl-1,3,4-thiadiazolyl, 3-methyl-1,2,4-thiadiazolyl, 3-methoxy-1,2,4-thiadialzolyl, 1,3,4-thiadiazol-5-yl, 2-amino-1,3,4-thiadiazolyl, 3-hydroxy-carbonylmethyl-1,2,4-thiadiazolyl, 5-methoxy-1,2,4-thiadiazolyl, 4-methyl-5-hydroxycarbonyl-methyl-1,3-thiazolyl and 1-dimethylaminoethyl-tetrazol-5-yl A is selected from the group consisting of hydrogen, alkali metal, alkaline earth metal, $—NH_4$, an easily cleavable ester selected from the group consisting of methoxymethyl, ethoxymethyl, isopropoxymethyl, α-methoxyethyl, α-ethoxyethyl, methylthiomethyl, ethylthiomethyl, isopropylthiomethyl, pivaloyloxymethyl, acetoxymethyl, propionyloxymethyl, isobutyryloxymethyl, isovaleryloxymethyl, propionyloxyethyl, isovaleryloxyethyl, 1-acetoxyethyl, 1-acetoxypropyl, 1-acetoxybutyl, 1-acetoxyhexyl and 1-acetoxyheptyl and a non-toxic, pharmaceutically acceptable organic amine, A_1 is selected from the group consisting of alkyl of 1 to 3 carbon atoms, hydrogen, alkali metal, alkaline earth metal, $—NH_4$, an easily cleavable ester selected from the group consisting of methoxymethyl, ethoxymethyl, isopropoxymethyl, α-methoxyethyl, α-ethoxyethyl, methylthiomethyl, ethylthiomethyl, isopropylthiomethyl, pivaloyloxymethyl, isobutyryloxymethyl, acetoxymethyl, propionyloxymethyl, isobutyryloxyethyl, isovaleryloxyethyl, propionyloxyethyl, isovaleryloxyethyl, 1-acetoxyethyl, 1-acetoxypropyl, 1-acetoxybutyl, 1-acetoxyhexyl and 1-acetoxyheptyl and a non-toxic, pharmaceutically acceptable organic amine and a non-toxic, pharmaceutically acceptable addition salt thereof.

4,287,194

COMPOSITIONS WITH POTENTIATED HYPOTENSIVE EFFECTS

Edit Kosa; Janos Borvendeg; Zsuzsanna Huszti; Judit Kosary; Geza Szilagyi; Laszlo Tardos; Endre Kasztreiner; Laszlo Nagy; Erzsebet Szuics, and Gabriella Kiss, all of Budapest, Hungary, assignors to Richter Gedeon Vegyészeti Gyár Rt., Budapest, Hungary

Filed Jul. 6, 1979, Ser. No. 55,263

Claims priority, application Hungary, Jul. 14, 1978, GO 1412

Int. Cl.³ A61K *31/535, 31/495, 31/40, 31/235*

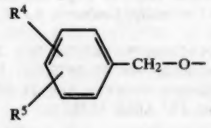
U.S. Cl. 424—248.51 **13 Claims**

1. A pharmaceutical composition with increased hypotensive effect, comprising a compound of formula (I) or a pharmaceutically acceptable acid addition salt thereof,

(I)

wherein

R^1 is a group of formula (II),



(II)

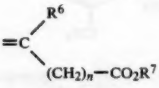
wherein

R^4 and R^5 each are hydrogen, hydroxy, nitro or C_{1-4} alkoxycarbonyl, and at the same time

R^2 and R^3 each are hydrogen, or

R^1 is 3-chloro-6-pyridazinylamino, 3-methyl-6-pyridazinylamino or 3-carbamoyl-6-pyridazinylamino group, and at the same time

R^2 and R^3 form together a group of formula (III),



(III)

wherein

R^6 is C_{1-4} alkyl group,

R^7 is hydrogen or a C_{1-4} alkyl group, and

n is an integer of 1 to 3, or

R^2 and R^3 form together a group of formula (IV),

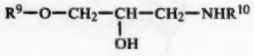
(IV)

wherein

Q is a C_{5-7} cycloaliphatic group, and

R^8 is hydrogen, C_{1-4} alkoxycarbonyl or C_{2-4} alkyl;

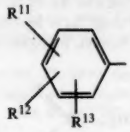
and a β receptor blocking compound of formula (V) or a salt thereof,



(V)

wherein

R^9 stands for naphthyl, 4-indolyl or 4-morpholino-1,2,5-thiadiazol-3-yl group or a group of formula (VI),



(VI)

wherein

R^{11}, R^{12} and R^{13} are the same or different and represent hydrogen, halogen, hydroxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{2-4} alkenyloxy, 2-methoxyethyl or acetic amide; but that when two of R^{11}, R^{12} and R^{13} are hydrogen, the third is other than hydrogen, or when two of R^{11}, R^{12} and R^{13} are acetic amide, the third is other than acetic amide, and R^{10} stands for C_{1-4} alkyl, in admixture with at least one conventional pharmaceutical additives, wherein the compound of formula I is a hypotensive potentiating agent present in an effective amount to potentiate the β receptor blocking compound of V.

4,287,195

HETEROCYCLIC DERIVATIVES OF [4-(PIPERAZIN-1-YL-PHENYLOXYMETHYL)-1,3-DIOXOLAN-2-YLMETHYL]-1H-IMIDAZOLES AND 1H-1,2,4-TRIAZOLES

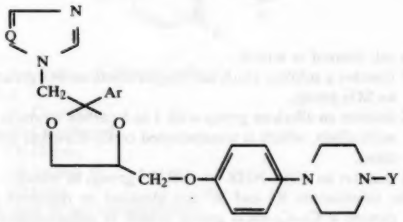
Jan Heeres, Vosselaar, and Robert Hendrickx, Beerse, both of Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 924,765, Jul. 14, 1978, abandoned. This application Apr. 4, 1979, Ser. No. 27,178

Int. Cl.[3] **C07D** *419/14;* **A61K** *31/495*

U.S. Cl. 424—250 **5 Claims**

1. A chemical compound selected from the group consisting of an azole derivative having the formula:



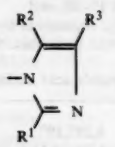
and the pharmaceutically acceptable acid addition salts and stereochemically isomeric forms thereof, wherein:

Q is a member selected from the group consisting of CH and N;

Ar is a member selected from the group consisting of phenyl, thienyl, halothienyl and substituted phenyl, said substituted phenyl having from 1 to 3 substituents each independently selected from the group consisting of halo, lower alkyl, lower alkyloxy and trifluoromethyl; and

the radical Y is an optionally substituted mono- or binuclear nitrogen-containing heteroaromatic radical selected from the group consisting of:

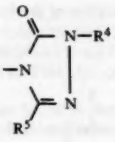
a radical of formula



(a)

wherein R^1 is selected from the group consisting of hydrogen, lower alkylthio, aryl lower alkylthio and arylthio and R^2 and R^3 are each independently selected from the group consisting of hydrogen, lower alkyl, aryl and aryl lower alkyl;

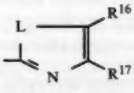
a radical of formula



(b)

wherein each of R^4 and R^5 are independently selected from the group consisting of hydrogen, lower alkyl, aryl and aryllower alkyl;

a radical of formula



(f)

wherein L is a member selected from the group consisting of S and N-R^{18}, said R^{18} being selected from the group consisting of hydrogen, lower alkyl and aryllower alkyl, and R^{16} and R^{17} are each independently selected from the group consisting of hydrogen, lower alkyl, nitro and aryllower alkyl, or R^{16} and R^{17}, when taken together, represent a radical of the formula —CH=CH—CH=CH—.

4,287,196

METHOD OF INHIBITING PROLACTIN SECRETION

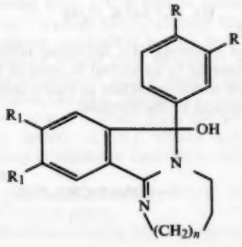
Ronald G. Babington, Denville, N.J.; F. Eugene Harrington, Albuquerque, N. Mex., and William J. Houlihan, Mt. Lakes, N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Filed Feb. 26, 1980, Ser. No. 124,810

Int. Cl.[3] **A61K** *31/33, 31/505*

U.S. Cl. 424—251 **7 Claims**

1. A method for inhibiting prolactin secretion which comprises administering to a mammal in need of said treatment an amount sufficient to inhibit prolactin secretion of a compound of the formula



(I)

where n represents 1 or 2,

each R, independently, represents hydrogen or halo of atomic weight about 19–36, and

each R_1, independently, represents hydrogen or said halo, provided that when one R_1 is halo, the other is hydrogen, or

a pharmaceutically acceptable acid addition salt thereof.

4,287,197

ANTIVIRAL ISOQUINOLINE DERIVATIVES

Daniel Farge, Thiais; Alain Jossin, St-Cloud; Gerard Ponsinet, Sucy-en-Brie, and Daniel Reisdorf, Thiais, all of France, assignors to Rhone-Poulenc Industries, Paris, France

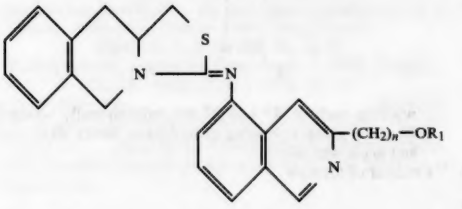
Filed May 6, 1980, Ser. No. 147,248

Claims priority, application France, May 9, 1979, 79 11707; Dec. 4, 1979, 79 29752

Int. Cl.³ A61K *31/47;* **C07D** *513/04*

U.S. Cl. 424—258 **7 Claims**

1. An isoquinoline derivative of the formula:



wherein R_1 represents alkyl of 1 through 8 carbon atoms and n represents 1 or 2, or a non-toxic pharmaceutically acceptable acid addition salt thereof.

7. A pharmaceutical composition useful for the treatment of viral infections which comprises as active ingredient an effective amount of an isoquinoline derivative as claimed in claim 1 in the (S) form, or a non-toxic pharmaceutically acceptable acid addition salt thereof, in association with a significant amount of a pharmaceutically acceptable carrier.

4,287,198

PHARMACOLOGICALLY ACTIVE GUANIDINE COMPOUNDS

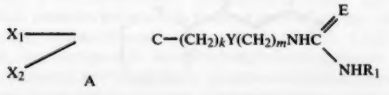
Graham J. Durant, Welwyn Garden City; John C. Emmett, Codicote, and Charon R. Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 10,105, Feb. 7, 1979, Pat. No. 4,221,802, which is a division of Ser. No. 847,285, Oct. 31, 1977, Pat. No. 4,154,844, which is a division of Ser. No. 765,040, Feb. 2, 1977, Pat. No. 4,070,475, which is a division of Ser. No. 637,499, Dec. 4, 1975, Pat. No. 4,024,171, which is a division of Ser. No. 450,957, Mar. 14, 1974, Pat. No. 3,950,333, which is a continuation-in-part of Ser. No. 290,584, Sep. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 230,451, Feb. 29, 1972, abandoned. This application Mar. 3, 1980, Ser. No. 126,809

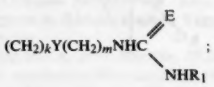
Int. Cl.³ A61K *31/44*

U.S. Cl. 424—263 **9 Claims**

1. A method of inhibiting H-2 histamine receptors which comprises administering to an animal in need of inhibition of said receptors in an effective amount to inhibit said receptors a heterocyclic compound of the formula:



wherein A is such that there is formed together with the carbon atom shown an unsaturated heterocyclic nucleus, said unsaturated heterocyclic nucleus being a 3-(5,6,7,8-tetrahydroimidazo[1,5-a]pyridine) ring; X_1 is hydrogen, lower alkyl, hydroxyl, trifluoromethyl, benzyl, halogen, amino or



X_2 is hydrogen or when X_1 is lower alkyl, lower alkyl or halogen; k is 0 to 2 and m is 2 or 3, provided that the sum of k and m is 3 or 4; Y is oxygen, sulphur or NH; E is NR_2; R_1 is hydrogen, lower alkyl or di-lower alkylamino-lower alkyl; and R_2 is hydrogen, nitro or cyano, or a pharmaceutically acceptable addition salt thereof.

4,287,199

BENZIMIDAZOLYLCARBAMIC ACID ESTERS SUBSTITUTED ON THE BENZENOID NUCLEUS BY AN OXY OR THIO SUBSTITUENT

Hartmund Wollweber, Wuppertal; Heinrich Kölling, Haan; Herbert Thomas, and Peter Andrews, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

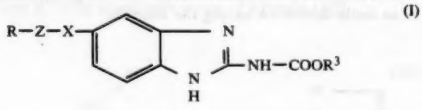
Filed Oct. 11, 1979, Ser. No. 83,883

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1978, 2845537

Int. Cl.³ A61K *31/445, 31/415;* **C07D** *235/32, 401/12*

U.S. Cl. 424—267 **10 Claims**

1. A 2-benzimidazolylcarbamic ester of the formula



(I)

or a salt thereof in which

X denotes a sulphur atom, an oxygen atom, an SO group or an SO_2 group,

Z denotes an alkylene group with 1 to 6 carbon atoms in the main chain, which is unsubstituted or C_1–C_4-alkyl substituted,

R denotes an NH_2, NHR^1 or NR^1R^2 group, in which the substituents R^1 and R^2 are identical or different and denote a C_1–C_6-alkyl group which is unsubstituted or substituted by halogen, cyano, C_1–C_4-alkoxy or nitro, a phenyl group which is unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, trifluoromethyl, nitro or cyano or a phenylalkyl group which is unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, trifluoromethyl, nitro or cyano in the aryl portion and which is C_1–C_4-alkyl in the alkyl portion,

or in which

R denotes a cycloalkyleneimino, cycloalkenylamino or cycloalkadienyleneimino group which has a total of 4 to 7 ring members and is unsubstituted or substituted by one or two C_1–C_4-alkyl groups, and

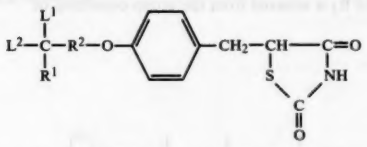
R^3 denotes a C_1 to C_4 alkyl group which is unsubstituted or substituted by C_1–C_4-alkoxy, halogen, trifluoromethyl, cyano or nitro or a C_2 to C_6 alkenyl group.

4,287,200
THIAZOLIDINE DERIVATIVES

Yutaka Kawamatsu, Kyoto, and Takeshi Fujita, Takarazuka, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 27, 1979, Ser. No. 62,512
Claims priority, application Japan, Aug. 4, 1978, 53-95673
Int. Cl.³ C07D *277/04*
U.S. Cl. 424—270 **8 Claims**

1. A thiazolidine derivative of the general formula:



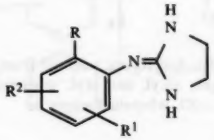
wherein R^1 is alkyl of 1 to 10 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, phenylalkyl of 7 to 11 carbon atoms, or phenyl; R^2 means a bond or a lower alkylene group; L^1 and L^2 are the same or different and each is lower alkyl or L^1 and L^2 are combined to form an alkylene group, provided that when R^1 is other than alkyl, L^1 and L^2 may further be hydrogen.

4,287,201
ANOVULATORY METHOD AND CHICKEN FEED COMPOSITIONS

George Olson, Clinton; Richard L. Tolman, Warren, and Roger M. Weppelman, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 3, 1980, Ser. No. 126,743
Int. Cl.³ A61K *31/415*
U.S. Cl. 424—273 R **18 Claims**

11. A method of arresting ovulation in poultry which comprises the administration to the poultry of an effective amount of an anovulatory compound of formula:



or a non-toxic salt thereof, wherein:

R is
(1) C_{1-4}alkyl,
(2) C_{2-5}alkenyl,
(3) chloro,
(4) bromo, or
(5) iodo;

R^1 and R^2 are independently
(1) C_{1-4}alkyl,
(2) C_{2-5}alkenyl,
(3) chloro,
(4) fluoro,
(5) bromo,
(6) iodo,
(7) hydrogen,
(8) nitro,
(9) amino,
(10) C_{1-3}alkylamino,
(11) di(C_{1-3}alkyl)amino,
(12) hydroxy,
(13) carboxy,
(14) C_{1-3}alkoxycarbonyl,
(15) C_{1-4}alkanoyl,
(16) C_{1-4}alkylthio,
(17) trifluoromethylthio,
(18) phenylthio,
(19) C_{1-3}alkylphenylthio,
(20) C_{1-3}alkoxyphenylthio,
(21) chlorophenylthio,
(22) bromophenylthio,
(23) phenoxy,
(24) C_{1-3}alkylphenoxy,
(25) C_{1-3}alkoxyphenoxy,
(26) chlorophenoxy,
(27) bromophenoxy,
(28) amino-C_{1-4}alkyl,
(29) C_{1-3}alkylamino-C_{1-4}alkyl,
(30) di(C_{1-3}alkyl)amino-C_{1-4}alkyl,
(31) hydroxy C_{1-4}alkyl, or
(32) C_{1-3}alkoxy-C_{1-4}alkyl.

4,287,202
TREATMENT AND/OR PROPHYLAXIS OF SPASMS OF CORONARY ARTERIES

David F. Horrobin, 110 Pine Ave., West, Montreal, Canada (H2W 1R7)

Filed May 14, 1979, Ser. No. 38,938
Claims priority, application United Kingdom, May 26, 1978, 23060/78
Int. Cl.³ A61K *31/405, 31/47*
U.S. Cl. 424—274 **2 Claims**

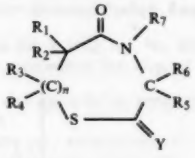
1. A method for the treatment and/or prophylaxis of spasms of coronary arteries causing angina pectoris or myocardial infarction in a subject which method comprises administering to the subject an effective amount therefor of indomethacin.

4,287,203
ANTIHYPERTENSIVE 1,4-THIAZEPINE-ONES, 1,4-THIAZONINE-ONES, AND METHOD OF USE THEREOF

John T. Suh, Greenwich, Conn.; Bruce E. Williams, Cottage Grove, Minn.; Jerry W. Skiles, Tuckahoe, and Bernard Loev, Scarsdale, both of N.Y., assignors to USV Pharmaceutical Corporation, Tuckahoe, N.Y.

Filed Apr. 23, 1980, Ser. No. 142,945
Int. Cl.³ A61K *31/55*; C07D *281/04, 281/18*
U.S. Cl. 424—275 **21 Claims**

1. A compound of formula



wherein:

n is an integer from 0 to 2 inclusive,

R_1, R_2, R_3, R_4, R_5, R_6 and R_7 are independently hydrogen, alkyl having from 1 to 6 carbon atoms, alkenyl having from 2 to 6 carbon atoms, alkynyl having from 3 to 6 carbon atoms, cycloalkyl having from 3 to 16 carbon atoms, phenyl, benzyl, tolyl, phenethyl, naphthyl, tetrahydronaphthyl, indanyl, decahydronaphthyl, or substituted alkyl wherein the alkyl group has 1 to 6 carbon atoms and the substituent is selected from the group consisting of hydroxy, amino, carboxy, alkoxy and carbalkoxy, the alkyl group in alkoxy or carbalkoxy having 1 to 6 carbon atoms, and

Y is =O, =S, =NR_1, =NOR_1 or =N—NH_2, R_1 being the same as defined above.

21. A method for reducing blood pressure in mammals having hypertension which comprises administering an anti-hypertensivelly effective amount of a compound of claim **1**.

4,287,204

1,3-BENZODITHIOL-2-ONES

Saleem Farooq, Ettingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

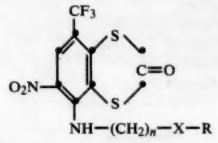
Filed Apr. 15, 1980, Ser. No. 140,537

Claims priority, application Switzerland, Apr. 25, 1979, 3888/79; Nov. 21, 1979, 10388/79

Int. Cl.³ A01N *43/28;* C07D *339/06*

U.S. Cl. 424—277 **8 Claims**

1. A compound of the formula I



wherein X is —O— or —S—, R is C_1–C_4alkyl, and n is 2 or 3.

7. A method for controlling insects and acarids which are parasites of plants or animals, which comprises applying to said plants or animals an insecticidally or acaricidally effective amount of a compound according to claim **1**.

4,287,205

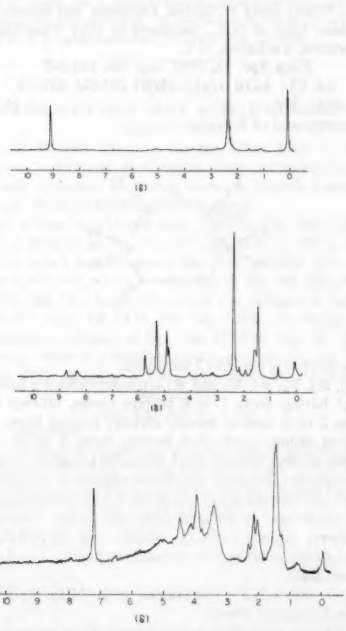
HYPOTENSIVE AND ANALGESIC COMPOUNDS AND COMPOSITIONS AND METHODS FOR USING SAME

Albert Szent-Györgyi, Woods Hole, Mass., and Gabor B. Fodor, Morgantown, W. Va., assignors to National Foundation for Cancer Research, Bethesda, Md.

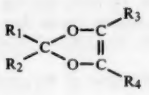
Continuation of Ser. No. 917,327, Jun. 20, 1978, abandoned. This application Nov. 13, 1979, Ser. No. 93,594

Int. Cl.³ A61K *31/335;* C07D *317/10*

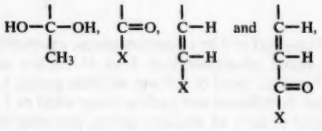
U.S. Cl. 424—278 **17 Claims**



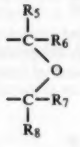
1. A compound of the formula



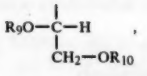
(I) wherein R_1 is selected from the group consisting of



wherein R_2 is selected from the group consisting of hydrogen, alkyl, aryl and R_1, wherein R_3 and R_4 are selected from the group consisting of hydrogen, alkyl, and aryl, or wherein R_3 and R_4 together form



wherein R_5, R_6, R_7, and R_8 are selected from the group consisting of hydrogen, alkyl, and aryl, wherein R_5 and R_6 together may form =O, wherein R_8 may be



and wherein R_9 and R_{10} are selected from the group consisting of hydrogen, alkyl and aryl, and wherein X is selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl, hydroxyaryl and arylalkyl.

10. An analgesic composition comprising an effective amount of a compound of claim **1** for treating pain and a pharmaceutical carrier therefor.

11. A hypotensive composition comprising an effective amount of a compound of claim **1** for treating hypertension and a pharmaceutical carrier therefor.

14. A method for treating pain in humans and animals comprising intravenous injection of the composition of claim **12**.

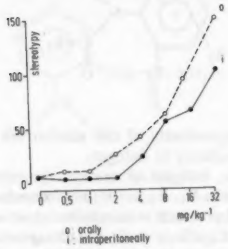
15. A method for treating hypertension in humans and animals comprising intravenous injection of the composition of claim **13**.

4,287,206

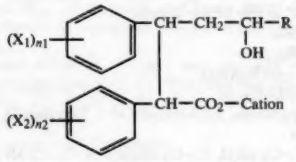
HALOGEN DERIVATIVES OF 8-HYDROXYCARBOXYLIC ACIDS; THE PROCESSES FOR THEIR PREPARATION AND MEDICAMENTS IN WHICH THEY ARE PRESENT

Pierre Simon, Sevres, and Jacques Dreux, Lyons, both of France, assignors to Laboratoires Hoechst, S.A., Puteaux, France

Filed Sep. 4, 1979, Ser. No. 72,411
Claims priority, application France, Sep. 5, 1978, 78 25457
Int. Cl.[3] A61K *31/335;* C07D *309/30;* C07C *59/11*
U.S. Cl. 424—279 6 Claims

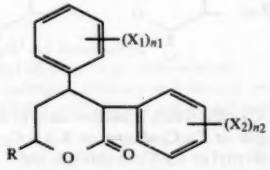


1. A compound of the formula



wherein X_1 and X_2 are chlorine atoms, n_1 and n_2 are integers between 0 and 5, but, if $n_1=O$, n_2 is different from O, and vice versa, R is hydrogen, alkyl or aryl and Cation represents a pharmaceutically acceptable cation.

2. A compound of the formula



wherein X_1 and X_2 are chlorine atoms, n_1 and n_2 are integ.. between 0 and 5, but, if $n_1=O$, n_2 is different from O, and vice versa, and R is hydrogen, aklyl or aryl.

6. A medicinal composition for treating depressions comprising an antidepressively effective amount of a dose between 10 and 500 mg/day of a compound as claimed in any of claims 1, 2, 3, 4, and 5.

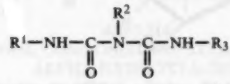
4,287,207

PHARMACEUTICAL COMPOSITION CONTAINING 1,3,5-SUBSTITUTED BIURET COMPOUND

Hajime Fujmura, Kyoto; Yasuzo Hiramatsu, Otsu; Takahiro Yabuuchi, Takarazuka; Masakatu Hisaki, Hikone; Katsuo Takikawa, Naruto; Takaji Honna, Tokushima; Hidekazu Miyake, Tokushima, and Makoto Kajitani, Tokushima, all of Japan, assignors to Taiho Pharmaceutical Company, Limited, Tokyo, Japan

Filed Mar. 27, 1980, Ser. No. 134,411
Claims priority, application Japan, Mar. 31, 1979, 54/38791; Mar. 31, 1979, 54/38793
Int. Cl.[3] A61K *31/17, 31/22, 31/145, 31/275*
U.S. Cl. 424—282 6 Claims

1. A method of treating a patient requiring analgesia, said method comprising administering to said patient an analgesic amount of a compound of the formula (1):



(1)

wherein R^1 is a hydrogen atom, a lower alkyl group, a substituted lower alkyl group having chlorine atom(s), cyano group(s), dimethylamino group(s), hydroxy group(s), methoxy group(s) or carboxy group(s) as the substituents, a lower alkenyl group, a hydroxy group, a methoxy group, an acetyl group or a phenyl group; R^2 is a hydrogen atom, a lower alkyl group or a phenyl group; R^3 is a phenyl group or a substituted phenyl group having halogen atom(s), trifluoromethyl group(s), methyl group(s), methyoxy group(s), methylenedioxy group(s), hydroxy group(s), dimethylamino group(s), carboxyl group(s) or carboxymethyl group(s) as the substituents(s), or a benzyl group.

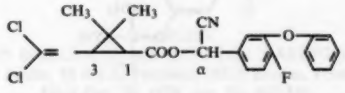
4,287,208

COMBATING ARTHROPODS WITH STEREOISOMERS OF 2,2-DIMETHYL-3-(2,2-DICHLOROVINYL)-CYCLOPROPANE-1-CARBOXYLIC ACID α-CYANO-3-PHENOXY-4-FLUORO-BENZYL ESTER

Rainer Fuchs, Wuppertal; Ingeborg Hammann, Cologne; Bernhard Homeyer, Leverkusen; Wolfgang Behrenz, Overath, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 3, 1980, Ser. No. 165,927
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1979, 2928986
Int. Cl.[3] A01N *53/00;* C07C *121/75*
U.S. Cl. 424—304 10 Claims

1. A substantially pure stereoisomer of 2,2-dimethyl-3-(2,2-dichlorovinyl)-cyclopropane-1-carboxylic acid α-cyano-3-phenoxy-4-fluorobenzyl ester of the formula



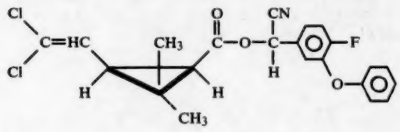
selected from the group consisting of esters in which the asymmetric C atoms 1, 3, and α have the following configuration:

Isomer	Absolute configuration at the center		
	1	3	α
a	R	R	R
b	R	R	S
c	R	S	R

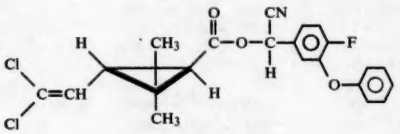
-continued

Isomer	Absolute configuration at the center		
	1	3	α
d	R	S	S
e	S	S	S
f	S	S	R
g	S	R	S
h	S	R	R.

the diastereomeric mixture of (1R)-cis-2,2-dimethyl-3-(2,2-dichlorovinyl)-cyclopropane-1-carboxylic acid (R,S)-α-cyano-3-phenoxy-4-fluoro-benzyl esters of the formula



and the diastereomeric mixture of (1R)-trans-2,2-dimethyl-3-(2,2-dichlorovinyl)-cyclopropane-1-carboxylic acid (R,S)-α-cyano-3-phenoxy-4-fluoro-benzylesters of the formula



9. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodicidally effective amount of a substantially pure compound according to claim **1**.

4,287,209

DERIVATIVES OF PHENOXYALKYLCARBOXYLIC ACIDS

Bernard Majoie, Dijon, France, assignor to Societe de Recherches Industrielles (S.O.R.I.), France

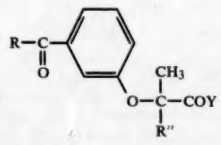
Division of Ser. No. 714,504, Aug. 16, 1976, Pat. No. 4,146,385. This application Jan. 4, 1979, Ser. No. 1,011

Claims priority, application United Kingdom, Aug. 20, 1975, 34689/75

Int. Cl.[3] **A61K** *31/215;* **C07C** *69/66*

U.S. Cl. 424—308 **11 Claims**

1. A compound of the formula:



wherein R is a member selected from the group consisting of 4-chlorophenyl, 3-chlorophenyl, 4-bromophenyl, phenyl, 4-methoxyphenyl, 4-fluorophenyl, and 4-trifluoromethylphenyl; R'' is a member selected from the group consisting of hydrogen and C_1–C_4 alkyl; and Y is a member selected from the group consisting of straight and branched C_1–C_{12} alkoxy.

11. A therapeutic composition for the treatment of cardiovascular illness, comprising a therapeutically effective amount of at least one compound according to claim **1**, in association with a physiologically acceptable excipient.

4,287,210

MICROBICIDAL META OXY- AND THIO-SUBSTITUTED PHENYLANILINES

Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany; Walter Kunz, Oberwil, and Adolf Hubele, Magden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

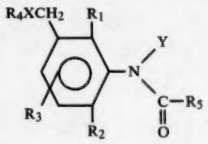
Filed Nov. 21, 1979, Ser. No. 97,026

Claims priority, application Switzerland, Nov. 27, 1978, 12118/78

Int. Cl.[3] **A01N** *37/10;* **C07C** *101/447*

U.S. Cl. 424—309 **8 Claims**

1. A compound of the formula I, including salts and metal complexes thereof



(I)

wherein

R_1 and R_2 independently of one another are each C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen,

R_3 is hydrogen, halogen or methyl, the total number of carbon atoms in R_1, R_2 and R_3 not exceeding 6,

R_4 is C_1–C_6-alkyl which is unsubstituted or substituted by halogen, C_1–C_4-alkoxy or C_1–C_4-alkoxycarbonyl; or R_4 is C_3–C_4 -alkenyl; C_3–C_4-alkynyl which is unsubstituted or substituted by halogen; or it is C_3–C_7-cycloalkyl; or phenyl which is unsubstituted or substituted by halogen, C_1–C_3-alkyl, C_1–C_3-alkoxy, nitro or trifluoromethyl; or R_4 is benzyl which is unsubstituted or substituted by halogen, C_1–C_3-alkyl or nitro,

X is oxygen or sulfur,

R_5 is 2-furyl or 2-tetrahydrofuryl each of which is unsubstituted or substituted by halogen; or R_5 is the group CH_2Z, where Z is one of the groups

(a) —OR_6,

(b) —SR_6,

(c) NH—$N(R_7)(R_8)$,

(d) —OSO_2R_9, or

(e) 1,2-pyrazole, 1,2,4-triazole or 1,3-imidazole,

wherein

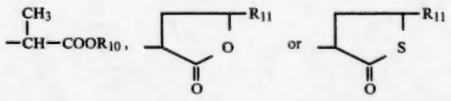
R_6 is C_1–C_6-alkyl, C_3–C_4-alkenyl or C_3–C_4-alkynyl,

R_7 is hydrogen or C_1–C_3-alkyl,

R_8 is C_1–C_3alkyl, or phenyl which is unsubstituted or is substituted by halogen or methyl, and

R_9 is C_1–C_4-alkyl or mono- or di-(C_1–C_3)-alkyl-amino, and

Y is



wherein

R_{10} is C_1–C_4-alkyl which is unsubstituted or is substituted by halogen or C_1–C_2-alkoxy; or R_{10} is C_2–C_4-alkenyl, C_3–C_4-alkynyl or C_3–C_7-cycloalkyl, and

R_{11} is hydrogen or methyl.

6. An insecticidal or fungicidal composition comprising (1) a bactericidally or fungicidally effective amount of compound according to claims **1**, **2**, **3**, **4** or **5**, and (2) an inert carrier.

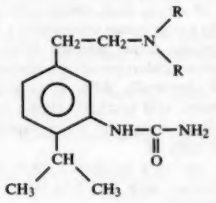
7. A method for controlling or preventing an infection of phytopathogenic bacteria or fungi which comprises applying to plants a bactericidally or fungicidally effective amount of a compound according to claims **1**, **2**, **3**, **4** or **5**.

4,287,211
DERIVATIVES OF PHENYLETHYLAMINES, PROCESSES FOR THEIR PREPARATION AND RELATED PHARMACEUTICAL COMPOSITIONS

Giorgio Ferrari, and Vittorio Vecchietti, both of Milan, Italy, assignors to Simes, S.p.A., Milan, Italy

Filed Dec. 28, 1979, Ser. No. 108,157
Claims priority, application Italy, Jan. 23, 1979, 19531 A/79
Int. Cl.[3] A61K *31/17;* C07C *127/19*
U.S. Cl. 424—322 15 Claims

1. A derivative of phenylethylamine, substituted in the aromatic ring and in the amino group of the side chain, having the general formula:



(I)

wherein R is hydrogen or a lower alkyl.

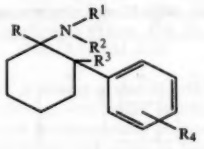
6. A pharmaceutical composition for the therapy of diseases of the digestive apparatus, particularly gastric and/or duodenal ulcers, gastritis, etc., characterized by containing, as the active ingredient an effective amount of a derivative of phenylethylamine according to claim 1 and a suitable pharmaceutical vehicle.

4,287,212
2-ARYL-1,2-DIALKYLCYCLOALKYLAMINES

Grover C. Helsley, Pottersville, N.J.; Horst Dornauer, Kelkheim, Fed. Rep. of Germany, and Larry Davis, Flemington, N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Continuation of Ser. No. 682,133, Apr. 30, 1976, abandoned.
This application Feb. 27, 1978, Ser. No. 881,529
Int. Cl.[3] A01N *33/02, 37/30;* C07C *87/50*
U.S. Cl. 424—330 8 Claims

1. A compound of the formula:



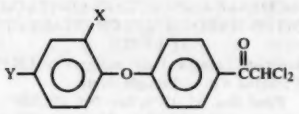
where
R, R^1 and R^3 are lower alkyl,
R^2 is alkenyl of three to six carbon atoms,
and R^4 is hydrogen, methoxy or hydroxyl, or a physiologically tolerable acid addition salt of said compound.

4,287,213
DICHLOROACYL DIPHENYL ETHER MITE OVACIDES

John W. Kobzina, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 3, 1980, Ser. No. 126,254
Int. Cl.[3] A01N *35/00;* C07C *49/233*
U.S. Cl. 424—331 5 Claims

1. A compound having the formula



wherein one of X or Y is chloro and the other is trifluoromethyl.

4. A mite ovacide composition which comprises an effective amount of the compound of claim 1 and an inert carrier.

4,287,214
DITHRANOL COMPOSITIONS STABILIZED WITH ALPHA HYDROXYACIDS

Eugene J. Van Scott, 1138 Sewell La., Rydal, Pa. 19046, and Ruey J. Yu, 4 Lindenwold Ave., Ambler, Pa. 19002

Filed Sep. 24, 1979, Ser. No. 78,181
Int. Cl.[3] A61K *31/05*
U.S. Cl. 424—346 24 Claims

1. In a composition containing a anti-inflammatory effective amount of dithranol in a pharmaceutically acceptable vehicle for topical application, the improvement comprising: a stabilizing effective amount of at least one member selected from the group consisting of: a glyceric acid or a derivative thereof having the formula

$$R(CR_1OH)_n\,COOH$$

wherein
n=2,3,4,5,6, or 7 and
R,R_1=H, CHO, or alkyl having from 1 to 7 carbon atoms, or the lactone or amide thereof; and an alpha hydroxy polycarboxylic or a derivative thereof having the formula

$$(CRX)_m\,(COOH)_n$$

wherein
m=1,2,3,4,5, or 6
n=2,3,4 and
X=OH or H when $m \geqq 2$ and with one or more than one OH group present.
R=H, CHO, or alkyl having from 1 to 7 carbon atoms, or the lactone, amide or salt thereof.

4,287,215
BRAN BREAD AND METHOD FOR MAKING SAME

Gerard Joulin, 44 rue de Pontoise, 95870 Bezons, France

Filed Oct. 18, 1978, Ser. No. 952,586
Claims priority, application France, Oct. 21, 1977, 77 31711
Int. Cl.[3] A21D *13/02*
U.S. Cl. 426—19 7 Claims

1. A method for obtaining bran bread by preparation of a dough based on wheat flour, bran and water, which is subjected to baking, after fermentation with yeast, wherein said wheat flour is of the type comprising at least 12% by weight of proteins, the bran being obtained from said wheat flour ground by a millstone and which after grinding, has been sieved to keep only the particles of dimensions between 0.5 and 1 mm.

4,287,216

CHOCOLATE CONFECTION CONTAINING CARBONATED HARD CANDY CRYSTALS DISPERSED THEREIN

Santi F. Mangano, Perugia, Italy, assignor to I.B.P. Industrie Buitoni Perugina S.p.A., Perugia, Italy

Filed Dec. 31, 1979, Ser. No. 108,703

Claims priority, application Italy, Nov. 16, 1979, 50844 A/79

Int. Cl.[3] A23G *9/00*

U.S. Cl. 426—93 **7 Claims**

1. A confectionery product, which comprises at least two components, the first component being chocolate, and the second component being a certain number of popping candied crystals, said chocolate and said popping candied crystals having a moisture content between about 0.1 and about 5.0%, said crystals being sugar crystals such as saccharose, glucose, lactose, maltose, and fructose, and containing a gas such as carbon dioxide, hydrogen, air or inert gas, at a pressure of about 1 to about 80 atmospheres and in a quantity between about 0.1 and about 1% in weight, the ratio between the first and second component being between 10:1 and 1:10 by weight.

4,287,217

MULTIPLE-LAYER TUBING

Klaus-Dieter Hammer, Mainz; Martin Schröder, Wiesbaden; Horst Pietruck, Schwabenheim, and Max Bytzek, Naurod, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 4, 1978, Ser. No. 931,133

Claims priority, application Luxembourg, Aug. 5, 1977, 77930; May 16, 1978, 79665

Int. Cl.[3] F16L *11/00*; A23L *1/31*; B05D *7/22*

U.S. Cl. 426—105 **43 Claims**

1. A multiple layered film in the form of a tubular sausage casing, comprising:

a central layer of a cellulose hydrate-based material;

a first layer on the inside surface of said central layer, said first layer comprising a continuous film of a first polymer comprising thermoplastic synthetic resinous material selected from a vinylidene chloride copolymer having a major proportion of vinylidene chloride, said thermoplastic synthetic resinous film being impermeable to water and water vapor; and

a second layer on the outside surface of said central layer, said second layer comprising a film of a second polymer different from said first polymer and comprising a synthetic elastic copolymer selected from the group consisting of (a) a copolymer comprising a major proportion of an acrylate, a methacrylate or a mixture thereof and a minor portion of acrylic acid, methacrylic acid or a mixture thereof, (b) a copolymer comprising a major proportion of an aliphatic diene, selected from the group of butadiene, isoprene, chloroprene or a mixture thereof, and (c) a blend of chemically different copolymers of said elastic copolymers, said synthetic elastic copolymer film being permeable to water and water vapor.

2. In a sausage product having a filling and a sausage casing, the improvement which comprises said sausage casing comprising the tube as defined by claim **1**.

26. A process for producing a multiple layered film in the shape of a tube comprising:

a central layer of a cellulose hydrate-based material;

a first layer of the inside surface of said central layer, said first layer comprising a continuous film of a first polymer comprising thermoplastic synthetic resinous material selected from a vinylidene chloride copolymer having a major proportion of vinylidene chloride, said thermoplastic synthetic resinous film being impermeable to water and water vapor;

a second layer on the outside surface of said central layer, said second layer comprising a film of a second polymer different from said first polymer and comprising a synthetic elastic copolymer selected from the group consisting of (a) a copolymer comprising a major proportion of an acrylate, a methacrylate or a mixture thereof and a minor portion of acrylic acid, methacrylic acid or a mixture thereof, (b) a copolymer comprising a major proportion of an aliphatic diene, selected from the group of butadiene, isoprene, chloroprene or a mixture thereof, and (c) a blend of chemically different copolymers of said elastic copolymers, said synthetic elastic copolymer film being permeable to water and water vapor; said process comprising the steps of

coating a carrier tube of a cellulose hydrate-based material on its inside surface with said first layer of a synthetic thermoplastic polymer;

applying to the outside surface of said carrier tube an aqueous dispersion of said synthetic elastic copolymer, wherein the major proportion of said copolymer comprises particles having a size not larger than about 0.08 μm, to produce on the outside surface of the carrier tube a layer of copolymer having a thickness corresponding to a weight per unit area of from about 0.5 to 8 gram of copolymer per m^2 of carrier tube surface; and

drying the tube to remove the water from said dispersion.

4,287,218

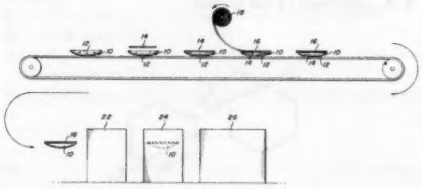
READY-TO-EAT MOLDED MEAT PRODUCT

Norman I. Rich, 3501 15th St. Ct., Rock Island, Ill. 61201, and Martin D. Rich, 6235 Crow Valley Dr., Bettendorf, Iowa 52722

Continuation-in-part of Ser. No. 618,350, Oct. 1, 1975, abandoned. This application Apr. 22, 1976, Ser. No. 679,186

Int. Cl.[3] A23L *1/31*; A22C *17/00*

U.S. Cl. 426—272 **19 Claims**



1. A process for preparing a ready-to-eat meat product comprising the steps of:

(a) grinding meat of bovine, ovine, porcine or avian species into small pieces

(b) mixing the ground meat pieces together to draw protein to the surface thereof

(c) mixing the ground meat pieces with a meat broth solution

(d) placing the mixed, ground meat pieces in an open mold

(e) laying a flexible film over the open portion of the mold

(f) applying a sufficient vacuum to the interior of the mold to draw the flexible film into sealing engagement with that part of the mold defining the open portion thereof, such that the air holes and voids between the meat pieces are eliminated and the meat pieces are caused to adhere together, and

(g) cooking the molded meat while under said vacuum.

6. A process for preparing a ready-to-eat meat product comprising the steps of:

(a) grinding meat of the bovine, ovine, porcine or avian species into small pieces,

(b) mixing the ground meat pieces together to draw protein to the surface thereof

(c) mixing the ground meat pieces with turkey broth, a phosphate solution, a spice mix and a meat emulsion

(d) placing the mixed ground meat pieces in an open mold

(e) laying a flexible film over the open portion of the mold

(f) applying a sufficient vacuum to the interior of the mold to draw the flexible film into sealing engagement with that part of the mold defining the open portion thereof, such that the air holes and voids between the meat pieces are eliminated, and

(g) cooking the molded meat while under said vacuum.

15. A process for preparing a ready-to-eat meat product comprising the steps of:

(a) grinding meat of the bovine, ovine, porcine or avian species into small pieces

(b) mixing the ground meat pieces together to draw protein to the surface thereof

(c) placing the mixed, ground meat pieces in an open mold made of a temperature responsive plastic material

(d) laying a flexible film over the open portion of the mold

(e) applying a sufficient vacuum to the interior of the mold to draw the flexible film into sealing engagement with that part of the mold defining the open portion thereof, such that the air holes and voids between the meat pieces are eliminated and the meat pieces are caused to adhere together

(f) subjecting the mold containing ground meat pieces to a hot water bath after air is evacuated from the mold, to effect shrinkage of the mold into tight engagement with the meat pieces for retaining the molded meat shape, and

(g) cooking the molded meat while under said vacuum.

4,287,219

FIBROUS EDIBLE PROTEINS HAVING FAT PARTICLES HOMOGENEOUSLY DISPERSED THERETHROUGH

Albert Fabre, Venissieux, France, assignor to Rhone-Poulenc Industries, Paris, France

Continuation-in-part of Ser. No. 876,053, Feb. 8, 1978, abandoned. This application Feb. 22, 1980, Ser. No. 123,917
Claims priority, application France, Feb. 10, 1977, 77 04307
Int. Cl.³ A23J *3/00*
U.S. Cl. 426—276 **23 Claims**

1. A process for preparing a shaped article comprising a spun, filamentary edible protein matrix, said filamentary matrix having uniformly and homogeneously dispersed therein, both in transverse cross-section and along its longitudinal axis, a plurality of fat-containing globules varying in diameter between about 1 to 60 microns, the degree of saponification of the fat-containing material comprising said globules being no greater than 5% and the protein in said matrix being substantially undegraded, which process comprises: admixing a gel of edible protein, prepared and maintained at a temperature of from about 2° to 25° C., with a fat-containing material maintained in liquid state, to form a spinning solution comprising said gel of edible protein and said fat-containing material; extruding said spinning solution through a shaping orifice; and passing the extruded material into a coagulating bath to coagulate the extruded material and thus form the shaped article, the period of time during which said gel of edible protein and said fat-containing material are in contact with each other not exceeding 2 minutes from initial contact up to extrusion through said shaping orifice.

4,287,220

HULL CONTAINING COMPOSITIONS

Clifford J. Pappas, Richardson, Tex., and Albert F. Vickers, Glenville, N.Y., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed Feb. 19, 1980, Ser. No. 122,803
Int. Cl.³ A23K *1/14*
U.S. Cl. 426—623 **17 Claims**

1. An essentially solid, blended, flowable composition comprising (a) about 40 to 80% of one or more materials selected from the group consisting of soybean hulls, rice hulls and peanut hulls and (b) about 20 to 60% of waste products from the manufacture of cooked farinaceous food products, or mixtures of such waste products, said percentages of (a) and (b) being based on the total of their weight, said waste products having on a total basis about 20 to 50 percent of undissolved solids derived from said manufacture and about 50 to 80 percent total moisture content based on the total weight of said solids and water, and the total moisture content of said blended composition being about 20 to 50%.

4,287,221

METHOD FOR PROVIDING ENTERIC COATING ON SOLID DOSAGE FORMS

Masayuki Tonedachi, Tokyo; Fujio Sekigawa, Omiya, and Katsuyoshi Minemura, Ageo, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jan. 2, 1980, Ser. No. 109,117
Claims priority, application Japan, Jan. 16, 1979, 54-4114
Int. Cl.³ A61K *9/32*
U.S. Cl. 427—3 **4 Claims**

1. A method for providing an enteric coating on a solid dosage from which comprises

(a) dispersing a hydroxpropylmethylcellulose phtalate having an average particle diameter not exceeding 100 μm in water containing triacetin amount from 5% to 50% by weight based on the amount of the hydroxypropylmethylcellulose phthalate at a temperature of 25° C. or below to form an aqueous coating liquid,

(b) spraying the thus prepared coating liquid on to the surface of the solid dosage form while the coating liquid is kept at a temperature of 25° C. or below to form a coating layer thereon, and

(c) drying the thus coated solid dosage form.

4,287,222

METHOD FOR PRESERVING PLANT MATERIAL

Ruth A. Robinson, 807 S. Warson Rd., St. Louis, Mo. 63124

Filed Oct. 26, 1979, Ser. No. 88,296
Int. Cl.³ A01G *5/06*
U.S. Cl. 427—4 **9 Claims**

1. A method of processing cut plant material comprising immersing the plant material to be processed in a liquid treatment agent comprising a polyol or mixtures thereof and having a specific gravity within the range of 1.10 to 1.16, subjecting the immersed plant material to a pressure within the range of 5 psi. to 40 psi. under ambient temperature for a time interval of between 2 to 7 days for absorption of the agent in the material, then withdrawing the plant material from the pressurized immersed state, and then permitting the withdrawn plant material to dry under ambient pressure and temperature.

4,287,223

COVERING A STEEL PIPE HAVING A WELDING SEAM WITH A THERMOPLASTIC COATING

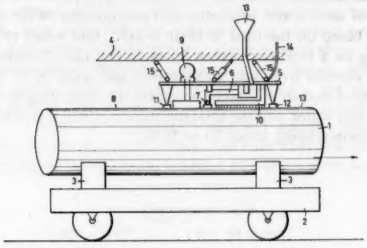
Karl-Heinz Hackert, and Helmut Blume, both of Muehlheim, Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Nov. 14, 1979, Ser. No. 94,231

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1978, 2849814

Int. Cl.[3] B05D *1/26*

U.S. Cl. 427—9 6 Claims



1. In a method of covering a steel pipe having a welding seam, with a layer of thermoplastic material, the improvement of heating the layer in the region of the welding seam; and

of extruding a strip of the same thermoplastic material as said layer onto the layer in the heated region above the welding seam to reinforce coverage thereof.

4,287,224

METHOD FOR REGULATING THE EVAPORATION RATE OF OXIDIZABLE SUBSTANCES IN REACTIVE VACUUM DEPOSITION

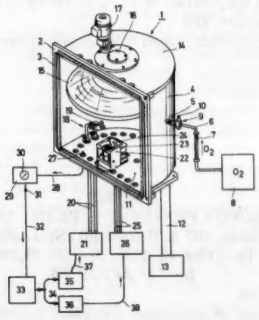
Klaus-Jürgen Heimbach, Hattersheim, and Walter Züllzke, Hanau, both of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Bonner Strabe, Fed. Rep. of Germany

Filed Aug. 9, 1979, Ser. No. 65,013

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1978, 2834813

Int. Cl.[3] B05D *1/00, 5/06*

U.S. Cl. 427—42 5 Claims



1. In a process for regulating the evaporation rate of oxidisable substances in reactive vacuum deposition by the metered addition of oxygen to a vacuum deposition chamber during deposition, the improvement comprising: adjusting the addition of oxygen to a predetermined value, measuring the pressure in the vacuum chamber, and regulating the evaporation rate for any pressure changes such that the ratio of pressure to evaporation rate is maintained substantially constant.

4,287,225

PROCESS OF MAKING A MAGNETIC RECORDING MEDIUM

Eckhart Kneller, Herbede; Roland Koenig, Ludwigshafen; Eberhard Koester, Frankenthal; Werner Grau, Bobenheim-Roxheim, and Dieter Mayer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 3, 1980, Ser. No. 126,895

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1979, 2909891

Int. Cl.[3] B05D *3/14*

U.S. Cl. 427—48 6 Claims

1. A process for the manufacture of a magnetic recording medium by vacuum-depositing a recording layer of an Sm-Co alloy onto a non-magnetic base which is dimensionally stable at up to 300° C., wherein the recording layer consists of an amorphous Sm-Co_x alloy, where x is from 1 to 20, possesses uniaxial magnetic anisotropy in the plane of the layer and has a coercive force of from 10 to 100 kA/m and a squareness ratio of more than 0.9, and the surface of the base is provided, parallel to the intended uniaxial anisotropy, with groove-shaped depressions having a depth of from 0.03 to 0.4 μm, at a spacing of from 10 to 200 μm.

4,287,226

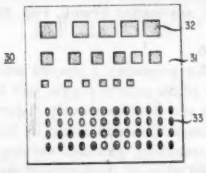
PROCESS FOR PRODUCING COVER COATED ELECTRONIC CIRCUITS

Juris Pirvics, Wayne, Pa., and Hargovind N. Vazirani, Stirling, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 659,943, Feb. 20, 1976, abandoned. This application Aug. 31, 1977, Ser. No. 829,232

Int. Cl.[3] B05D *3/06*

U.S. Cl. 427—54.1 10 Claims



1. A process for producing electronic circuits in which an ultraviolet curable coating is used to protect parts of the electronic circuit comprising the steps of:

(a) coating the electronic circuit with ultraviolet curable resin;

(b) positioning a mask so as to exclude ultraviolet light from certain areas of the electronic circuit coated with ultraviolet curable resin;

(c) irradiating the curable resin with ultraviolet light using a source of ultraviolet radiation so as to cure at least part of the resin; CHARACTERIZED IN THAT the ultraviolet radiation is directed toward the curable resin and the mask is mounted on a silk screen.

4,287,227

COATING COMPOSITION AND PROCESS FOR PRODUCING SYNTHETIC RESIN MOLDINGS BY USING THE SAME

Kazumasa Kamada; Isao Sasaki, and Kenji Kushi, all of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jan. 3, 1980, Ser. No. 109,245

Claims priority, application Japan, Jan. 17, 1979, 54-4569; Jun. 18, 1979, 54-77295

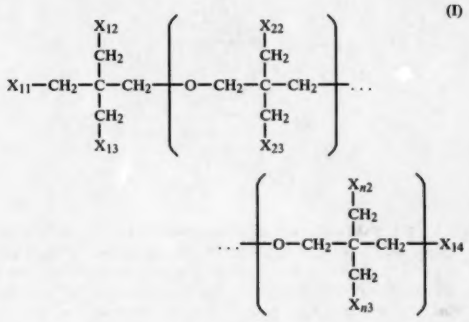
Int. Cl.³ B05D *3/06*

U.S. Cl. 427—54.1 **13 Claims**

1. A coating composition comprising

(a) a monomer mixture of 30 to 90% by weight of at least one poly(meth)acrylate of mono or polypentaerythritol having at least three (meth)acryloyloxy groups in one molecule of formula (I)

(I)

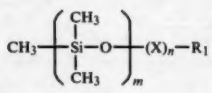


wherein at least three of X_{11}, X_{12}, X_{13}, X_{22}, X_{23}, . . . X_{n2}, X_{n3} and X_{14} are $CH_2{=}CR{-}COO{-}$ groups and the rest of them are —OH groups, n is an integer of 1 to 5 and R represents hydrogen or a methyl group, and 70 to 10% by weight of at least one monofunctional acrylate or methacrylate having at least one ether bond in one molecule, a boiling point above 150° C. under normal pressure and a viscosity below 20 centipoises at 20° C.;

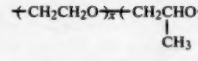
(b) 0.01 to 10 parts by weight of a photosensitizing agent per 100 parts by weight of said monomer mixture;

(c) 0.0001 to 2.0 parts by weight per 100 parts by weight of said monomer mixture of at least one silicon containing surface active agent of the formula (II) or (III):

(II)

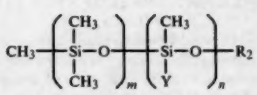


wherein X is

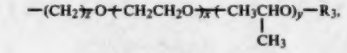


m and n are positive integers being smaller than 200 and x and y represent 0 or positive integers being smaller than 200 and satisfy the formula $0.1 \leqq (xn+yn/2m) \leqq 10$ and R_1 represents —H or an alkyl, acyl or aryl group having 1 to 6 carbon atoms or

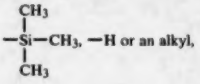
(III)



wherein Y is



m and n represent positive integers being smaller than 200, x and y represent 0 or positive integers being smaller than 200 and z represents 0 or a positive integer of 1 to 5 and satisfy the formula $0.1 \leqq (xn+yn/2m+n) \leqq 10$, R_2 represents



acyl or aryl group having 1 to 6 carbon atoms, and R_3 represents —H or an alkyl, acyl or aryl group having 1 to 6 carbon atoms; and

(d) 10 to 1900 parts by weight per 100 parts by weight of said monomer mixture of at least one organic solvent capable of forming a uniform solution upon mixing with said monomer mixture.

4,287,228

PHOTOPOLYMERIZABLE EPOXIDE COATING COMPOSITIONS CONTAINING TITANIUM DIOXIDE PIGMENT AND METHOD OF POLYMERIZATION USING SAME

Sheldon I. Schlesinger, East Windsor, N.J., assignor to American Can Company, Greenwich, Conn.

Filed Feb. 20, 1980, Ser. No. 122,883

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—54.1 **15 Claims**

1. In an epoxide coating composition, the combination comprising:

A. 54.7–89.7 percent by weight of a cationically polymerizable material consisting at least principally of an epoxide prepolymer;

B. 10–45 percent by weight of titanium dioxide pigment; and

C. 0.3–10.0 percent based upon the weight of said polymerizable material, of a photoinitiator component relatively stable to ambient white light but readily decomposable upon exposure to ultraviolet light to provide a Lewis acid to effect polymerization of said cationically polymerizable material, said photoinitiator component including: a first photoinitiator compound comprising an aryldiazonium salt wherein the aryldiazonium group is selected from the class consisting of 2,5-diethoxy-4-p-tolylmercaptobenzene diazonium, 4-chloro-2,5-dimethoxybenzene diazonium, 2,5-dimethoxybenzene diazonium, 2,5-dimethoxy-4-p-tolylbenzene diazonium and 2,5-dibutoxy-4-benzamidobenzene diazonium, and mixtures thereof, and wherein the salt group is selected from the class consisting of hexafluorophosphates, fluoroborates, fluoroantimonates and fluoroarsenates, and mixtures thereof; and a second photoinitiator compound relatively stable to ultraviolet radiation having a wavelength of at least 355 nanometers and decomposable by ultraviolet radiation having a wavelength of 200–355 nanometers.

4,287,229

METHOD FOR SURFACE TREATMENT OF PHOSPHOR PARTICLES

Minoru Watanabe, Tokyo; Mitsuhiro Oikawa, Kawasaki; Toshio Nishimura; Masao Asada, both of Yokohama; Masao Tezuka, Tokyo, and Tsurahide Cho, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushikikaisha, Kawasaki, Japan

Filed Nov. 5, 1979, Ser. No. 90,922
Claims priority, application Japan, Nov. 9, 1978, 53/137365
Int. Cl.[3] H01J *29/26*
U.S. Cl. 427—64 6 Claims

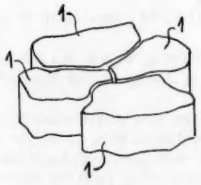
1. A method for surface treatment of phosphor particles consisting essentially of forming a continuous film of silicon dioxide on the surface of each phosphor particle by treating said phosphor particle with a solution containing an aqueous solution of organic alkali and silicon dioxide dissolved in said aqueous solution.

4,287,230

PROCESS FOR PRODUCING A SCINTILLATOR SCREEN

Jean-Pierre Galves, Paris, and Jean-Marie Gutierrez, Antibes, both of France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 821,217, Aug. 2, 1977, abandoned. This application Sep. 17, 1979, Ser. No. 76,039
Claims priority, application France, Aug. 3, 1976, 76 23726
Int. Cl.[3] H01J *1/62*
U.S. Cl. 427—65 8 Claims



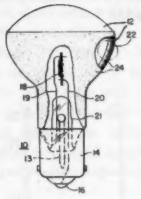
1. A process for the production of a scintillator screen having a substrate and a scintillator layer comprising the steps of keeping the substrate cold, while alternately depositing the vapor condensation cesium iodide doped with sodium and then an oxide and then alternating the deposition of the cesium iodide doped with sodium and the oxide until (a) the desired thickness of the scintillator layer is reached and (b) the deposited layer has a structure of fine needles substantially perpendicular to the substrate and optically independent from one another; and then heat treating the substrate and deposited layer to between 250° to 500° C., said oxide introduced into the crystal lattice of the cesium iodide doped with sodium during the chemical vapor deposition step prevents the needles from coalescing into crystals of larger size during said subsequent heating step.

4,287,231

METHOD OF SPRAY-REFLECTORIZING ELECTRIC LAMP ENVELOPES

Aristide R. DeCaro, Edison; Eugene F. Murphy, Pompton Plains, both of N.J., and Billy A. Maynard, Lexington, Ky., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 542,312, Jan. 20, 1975, abandoned, which is a division of Ser. No. 452,864, Mar. 20, 1974, Pat. No. 3,932,780. This application Apr. 4, 1980, Ser. No. 137,166
Int. Cl.[3] H01K *1/32;* B05D *1/12;* G02B *5/10, 1/10*
U.S. Cl. 427—106 6 Claims



1. In the manufacture of electric lamps having envelopes composed of vitreous light-transmitting material, the method of providing selected outer surface portions of the lamp envelopes with reflector coatings of mirror-like quality efficiently and in mass-production quantities, which method comprises;

dispersing a predetermined amount of aluminum flakes of selected minute size in a vaporizable liquid vehicle to form a reflector-coating composition, said aluminum flakes having a particle size in the range of from about 10 200 microns so that the composition can readily be dispensed by spraying means, and the amount of aluminum flakes in the reflector-coating composition relative to the vaporizable liquid vehicle being so correlated that the composition is of a type which permits the aluminum flakes to automatically orient themselves in substantially side-by-side planar relationship and inherently form a thin adherent film of aluminum when said composition is sprayed onto the lamp envelopes,

depositing, by means of a single spraying operation, a layer of the reflector-coating composition on the selected outer surface portions of each of the lamp envelopes, said spraying operation being done in a manner such that the deposited layer of the reflector-coating composition contains a sufficient number of aluminum flakes to form an aluminum film having a thickness of from about 10 to about 630 microns, when the flakes orient themselves in substantially planar relationship,

allowing the aluminum flakes in the wet spray-deposited layer of reflector-coating composition to arrange themselves in said planar relationship and thus form, in situ, a thin adherent film of aluminum that has a thickness of from about 10 to about 630 microns and is also specular at the envelope-film interface and thus provides a brilliant mirror-like reflector at said interface,

drying the spray-reflectorized portions of the lamp envelopes to set the aluminum reflector films, and then

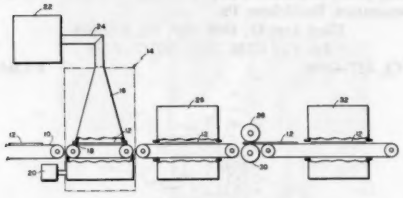
coating the mirror-like films of aluminum flakes with a protective layer of a material that holds the flakes in their film-forming relationship on the respective lamp envelopes without impairing the light-reflective capability of the aluminum films.

4,287,232

DRY FLOC METHOD FOR MAKING AN ELECTROCHEMICAL CELL ELECTRODE

Glen J. Goller, West Springfield, Mass., and Joseph R. Salonia, Middletown, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 28, 1978, Ser. No. 920,036
Int. Cl.[3] H01M *4/96;* B05D *1/30*
U.S. Cl. 427—113 14 Claims



1. A method for making an electrochemical cell electrode comprising the steps of:

applying a uniform layer of dry, powdered, carbon/hydrophobic polymer floc on the surface of a porous electrode substrate with virtually no floc within the pores of the substrate by positioning the substrate under a chamber having a bottom edge wherein the said bottom edge of the chamber fits against the edge of the substrate, dispersing the floc as a cloud of powder in the chamber over said surface of said positioned substrate and pulling the floc onto said surface by drawing a continuous vacuum under the substrate until the desired amount of powder has been deposited, wherein said substrate is graphitized carbon paper made from carbon fibers;

compacting the applied floc layer; and,

sintering the compacted layer.

4,287,233

MANUFACTURE OF ACICULAR COBALT-CONTAINING MAGNETIC IRON OXIDE

Peter Rudolf, Neuhofen; Werner Steck, Mutterstadt; Eberhard Koester; Manfred Ohlinger, both of Frankenthal, and Christof Jaeckh, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 29, 1980, Ser. No. 116,543
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1979, 2905352
Int. Cl.[3] C01G *49/06*
U.S. Cl. 427—127 4 Claims

1. A process for the manufacture of acicular magnetic iron oxide which consists of a core of gamma-iron (III) oxide surrounded by a ferrite shell containing, based on the amount of magnetic material, from 0.2 to 12% by weight of cobalt (II) ions and from 0.1 to 15% by weight of iron (II) ions, wherein one part by weight of acicular gamma-iron (III) oxide is suspended in not more than four parts by weight of water by vigorous stirring, aqueous solutions containing cobalt (II) ions and iron (II) ions and aqueous bases to bring the pH of the suspension to not less than 10 are added to this suspension at from 20° to 80° C. under an inert gas blanket, with continued stirring, and after the cobalt (II) hydroxide and iron (II) hydroxide precipitate has formed under the inert gas atmosphere the entire solid product is filtered off, washed neutral with water and heated in an inert gas atmosphere for from two to seven hours at from 130° to 180° C.

4,287,234

DESENSITIZING INK FOR THE RECEIVING SURFACE OF A CHEMICAL DUPLICATING SET BY WET OFFSET PRINTING

Albert Amon; Roger Weil, both of Lausanne, and Paul Heinzer, Pully, all of Switzerland, assignors to Sipca Holding S.A., Glarus, Switzerland

Continuation of Ser. No. 885,218, Mar. 10, 1978, abandoned.
This application Oct. 9, 1979, Ser. No. 82,749
Claims priority, application Switzerland, Jan. 25, 1978, 771/78
Int. Cl.[3] B41M *3/12*
U.S. Cl. 427—150 7 Claims

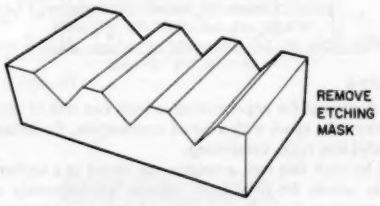
1. A process of desensitizing an acceptor surface of a chemical duplicating set having at least two superimposed sheets one of the facing surfaces of which has an electrophillic acceptor coating and the other a nucleophilic coating capable of producing a chromogenic reaction with the electrophillic acceptor coating, said process comprising printing in wet offset on said acceptor surface an ink coating comprising an alkoxylated nucleophilic compound wherein said compound is alkoxylated to a degree such that the hydrophile-lipophile balance of said ink is from 2 to 9 so as to permit both the continuous transfer of the ink from the inking rollers to the water repellant zones of the wetted impression plate of an offset press and simultaneously the neutralization of the corresponding zones of the acceptor surface of the duplicating set, thus prevent any colored formation in the said zones upon subsequent writing or typing on the said duplicating set.

4,287,235

X-RAY LITHOGRAPHY AT ~100 Å LINEWIDTHS USING X-RAY MASKS FABRICATED BY SHADOWING TECHNIQUES

Dale C. Flanders, Lexington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 29, 1979, Ser. No. 43,309
Int. Cl.[3] B05D *3/10;* G21K *3/00*
U.S. Cl. 427—160 7 Claims



1. A method for producing X-ray masks with precisely controlled linewidths including the steps of,

forming a relief structure with a predetermined cross section in a plane perpendicular to the surface of said relief structure; and

depositing X-ray absorber material onto said relief structure to form a plurality of interleaved regions of alternating high and low X-ray transmissivity for X-rays incident upon said relief structure from a predetermined shadowing direction that forms an oblique angle relative to said surface.

4,287,236

METHOD OF IMPROVING THE FREEZE RESISTANCE OF PARTICULATE MATERIAL AT LOW TEMPERATURES

Mark O. Kestner, Mendham, and Stephen H. Stoldt, Dover, both of N.J., assignors to Apollo Technologies, Inc., Whippany, N.J.

Filed Aug. 10, 1979, Ser. No. 65,612
Int. Cl.[3] C10L 9/00
U.S. Cl. 427—221 30 Claims

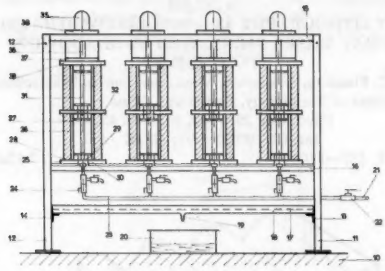
1. A method of improving the flow of particulate material at low temperatures by inhibiting clumping or solidification of large masses of said particles which comprises applying to the particles a coating of a polymer emulsion in water which has the characteristic of drying to form a water-insoluble film, exposing the particles en masse to external watering conditions and to temperatures below the freezing point of water, and then subjecting the particles at low temperatures to an operation in which they are caused to flow from one point to another under conditions such that clumping or solidification of large masses of said particles are deleterious, said coating being applied at the rate of between 2.0–5.0 pints of treatment material per ton of particulate material, the treatment material comprising polymer solids in an amount between 3.5–25% by weight of said treatment material.

4,287,237

PROCESS FOR IMPREGNATING SPOOLS OF TEXTILE WITH A LIQUID COMPOSITION

Pierre Prudhomme, Lozanne; Jean-Jacques Lafaye, Lyons, and Raymond Rey, Villeurbanne, all of France, assignors to Seperef - TMP Societe pour l'Equipment des Reseaux en Canalisations de Matieres Plastiques, Saint-Germain-au-Mont-D'or, France

Filed Aug. 8, 1979, Ser. No. 64,721
Int. Cl.[3] B05D 7/22
U.S. Cl. 427—238 5 Claims



1. A process for impregnating at least one reel of thread in the form of a spool with a liquid composition, for instance of crosslinkable resin, comprising;

(a) for each said reel, arranging the thread as a uniform reel in which the total open volume approximately corresponds to the desired volume of resin to be impregnated on a perforated rigid mandrel to form a spool, said mandrel having perforations which are staggered and spaced along the length of said mandrel except at the portions thereof aligned with the ends of each said spool,

(b) gripping each said spool at its ends and completely sealing same against fluid leakage from said ends, and

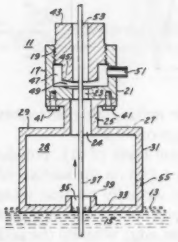
(c) injecting said composition under pressure through said perforated mandrel into each said spool so that there is a homogenous loss of pressure from said mandrel to the spool's exterior curved surface and the desired volume of resin uniformly and homogenously impregnates said spool by filling void-free the spaces between said threads and the interstices within said threads.

4,287,238

PROTECTIVE ATMOSPHERE GAS WIPING APPARATUS AND METHOD OF USING

Anthony J. Stavros, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Apr. 11, 1980, Ser. No. 139,605
Int. Cl.[3] C23C 1/00; B05C 11/06
U.S. Cl. 427—349 8 Claims



1. Improved apparatus for wiping linear material with a heavy wiping gas comprising:

(a) a containment means for a protective gas surrounding the linear material as it passes from a molten metal coating bath,

(b) a gas wiping die surrounding said linear material and having a restricted throat through which the linear material passes, said restricted throat being connected with the interior of the protective gas containment means of (a).

(c) substantially circumferential gas orifice means within the gas wiping die adjacent to the restricted throat of the die said gas orifices being inclined downwardly at an angle with respect to perpendicular to the surface of the linear material of from 5 to 60 degrees, and

(d) orifice means in the containment means of (a) having a cross sectional area less than the cross sectional area of the restricted throat and providing a passage for gas from the interior of the containment means to the exterior.

4,287,239

METHOD FOR WOOD PRESERVATION

Bror O. Hager, Forsetevagen 5, S-182 63 Djursholm, Sweden

Continuation-in-part of Ser. No. 4,449, Jan. 18, 1979, abandoned. This application Mar. 24, 1980, Ser. No. 132,890
Claims priority, application Sweden, Jan. 27, 1978, 7801013
Int. Cl.[3] B05D 3/02, 3/12, 1/18
U.S. Cl. 427—351 18 Claims

1. In a method of preserving foliiferous wood wherein the wood is penetrated by a preservative solution, the improvement comprising:

penetrating the wood with a solution having a wood preservative dissolved therein;

maintaining the wood in an undried condition for a period of time of at least two weeks sufficient for the preservative solution to diffuse through the cell walls of the wood without fixation thereof; and

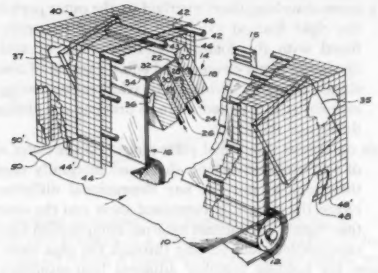
thereafter drying the wood so as to fix the preservative within the wood.

4,287,240

COATING APPARATUS PROVIDED WITH A PROTECTIVE SHIELD

Thomas R. O'Connor, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 11, 1980, Ser. No. 139,506
Int. Cl.³ B05C *3/02, 11/00;* B05D *3/40*
U.S. Cl. 427—402 32 Claims



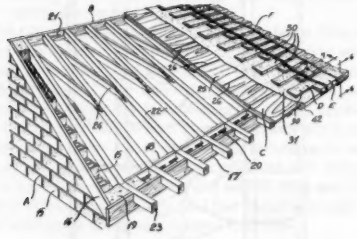
1. Coating apparatus comprising:
means for advancing an object to be coated,
means for forming a flow of coating composition for application to said advancing object, and
shield means formed of a foraminous material for protecting said flow of coating composition from disturbance by ambient air currents.

4,287,241

ROOF COATING COMPOSITION AND CONSTRUCTION

John H. Kaufmann, Somerset Parish, Bermuda, assignor to Global Coatings Limited, Hamilton, Bermuda

Division of Ser. No. 795,888, May 11, 1977, Pat. No. 4,160,346.
This application May 8, 1979, Ser. No. 37,303
Claims priority, application United Kingdom, May 11, 1976, 19410/76
Int. Cl.³ E04C *1/00*
U.S. Cl. 427—403 7 Claims



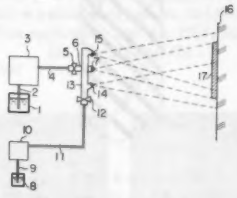
1. A method of providing a structural surface normally exposed to the elements with a protective load-bearing sheath, comprising,
spreading on said surfce in a continuous layer having a thickness from about 1.5 mm to about 5 mm a flowable cement composition made up of a modified hydraulic cement modified with a minor amount of an acrylic latex cement modifier, dense finely divided aggregate, reinforcing material, and water, allowing the material thus applied to harden to a continuous hard tough load-carrying concrete shell capable of taking up moisture covering said surface and adhering tenaciously to it,
spreading directly on the surface of the hard shell to form a continuous layer having a thickness from about 0.75 mm to about 3 mm a flowable mixture of a binder material of a non-plasticized latex of elastomeric type acrylic polymer filled with finely divided opaque extender, allowing the latex to dry into a rubbery textured protective membrane, having capillary openings to permit escape of moisture from the membrane itself and from the concrete shell, adhering tenaciously to the surface of the shell, whereby the shell and membrane constitute a continuous composite load-bearing weatherproof sheath protecting the structural surface.

4,287,242

SPRAY-COATING PROCESS

Takeshi Monden, Mie; Yoshiro Shiba; Toshiro Momonaka, both of Yokkaichi; Shigeru Kobayashi, Suzuka, and Kazuo Oda, Tokyo, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo and Japan Latex Compounding Co., Ltd., Yokkaichi, both of, Japan

Filed Aug. 8, 1979, Ser. No. 64,760
Claims priority, application Japan, Dec. 16, 1978, 53/154614
Int. Cl.³ B05D *1/02*
U.S. Cl. 427—426 9 Claims



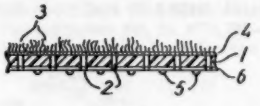
1. A spray-coating process which comprises spraying a rubber-asphalt anionic emulsion having a total solid content of at least 80% by weight and an aqueous solution containing 1–15% by weight of a polyvalent metal salt almost simultaneously by means of separate airless type spraying machines to continuously contact and mix said emulsion with said aqueous solution in the space between the spraying machine and the surface of a substrate to be coated and on the substrate surface, thereby forming a rubber-asphalt solid layer on the substrate surface.

4,287,243

MAT FOR MULTISPECTRAL CAMOUFLAGE OF OBJECTS AND PERMANENT CONSTRUCTIONS

Willi G. Nielsen, Monrovia, Liberia, assignor to Gottlieb Commercial Company A/S, Krusaa, Denmark

Filed Jul. 25, 1979, Ser. No. 60,470
Claims priority, application Denmark, Jul. 28, 1978, 3374/78
Int. Cl.³ F41H *3/00*
U.S. Cl. 428—17 6 Claims



1. A multispectral camouflage mat for camouflaging objects and permanent constructions comprising at least one heat insulating and heat reflecting layer containing at least one radar characteristic influencing material, said layer influencing the reflection and emission characteristics of said mat in the thermal infrared range and in the radar range, said layer having on its side which faces away from a camouflaged object or construction a visual diffusely reflecting layer comprising a material permeable to liquids which carries a fiber pile, the

fibers of said pile having free ends projecting from said heat insulating layer.

4,287,244

METHOD FOR REVERSE PRINTING ON COATED TUBE PAPERS AND TUBES PRODUCED FROM THE PAPER

Edward H. McMahon, Jr., and J. B. Abston, both of Hartsville, S.C., assignors to Sonoco Products Company, Hartsville, S.C.

Filed Dec. 3, 1979, Ser. No. 99,702

Int. Cl.[3] **B31C** *13/00;* **B32B** *1/06, 27/10*

U.S. Cl. 428—35 **11 Claims**

1. In a method for making a yarn tube or similar article comprising a tube body and an outer ply having indicia visible through an outer polymer lamina, the improvement comprising the steps of:

providing an outer ply comprising a lamina of a relatively porous paper-like substrate with the polymer lamina on one surface;

providing the outer ply with indicia by printing a dye onto at least a portion of the surface of the substrate opposite the polymer lamina under conditions wherein the dye is caused to be visible at an interface between the substrate and the polymer lamina; and

forming the printed outer ply onto the tube body with the polymer lamina comprising an outer surface of the tube.

8. The yarn tube produced by the method of claim 1.

4,287,245

HEAT INSULATOR FOR PIPE LINES

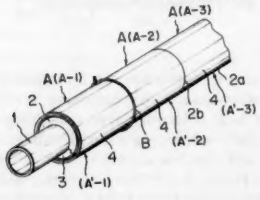
Siro Kikuchi, Yokohama, Japan, assignor to Nippon Asbestos Co., Ltd., Tokyo, Japan

Filed Apr. 30, 1979, Ser. No. 34,620

Claims priority, application Japan, Apr. 28, 1978, 53/58272[U]; May 8, 1978, 53/61275[U]; May 30, 1978, 53/73121[U]

Int. Cl.[3] **B32B** *3/30;* **F16L** *57/00, 59/02*

U.S. Cl. 428—36 **29 Claims**



1. A heat insulator for pipe lines with an outer periphery and used for transporting low-temperature fluids, said insulator comprising in combination:

a plurality of longitudinally divided hollow heat-insulating units assembled to tightly cover the outer periphery of said pipe lines, each heat-insulating unit including:

a heat-insulating panel element made of a rigid foamed synthetic resin with an outer periphery and having a shape of circular cross section to fit the outer periphery of said pipe lines:

a stress-absorbing sheet overlaid on the outer periphery of the rigid foamed synthetic resin and integrally combined with the foamed synthetic resin of said heat-insulating panel element and being capable of absorbing stress caused by shrinkage of said heat-insulating panel element at low temperature to prevent any dimensional difference therewith;

an outermost thin metal plate placed on the outer surface of said stress-absorbing sheet and integrally combined therewith to prevent any dimensional difference between the integrally combined sheet and the outermost thin metal plate against external compression caused by supercooled fluid passing through the pipe lines; and

means for holding together adjacent heat-insulating units combining two kinds of heat-insulating materials for higher and lower temperatures as joint sealer.

4,287,246

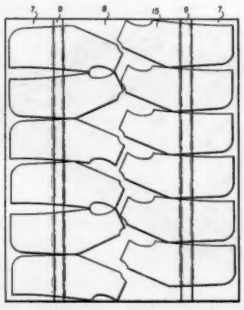
MULTIZONAL FIBER DISTRIBUTION

Alan Thornton, Halifax, and John S. Uttley, Hebden Bridge, both of England, assignors to Bondina, Ltd., Yorkshire, England

Continuation of Ser. No. 571,887, Apr. 25, 1975, abandoned. This application Nov. 10, 1976, Ser. No. 740,461

Int. Cl.[3] **B32B** *5/12, 5/06;* **H41D** *27/02*

U.S. Cl. 428—113 **16 Claims**



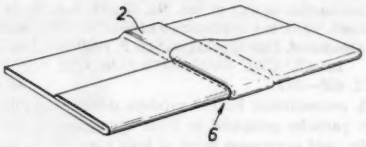
1. A garment interlining material comprising a non-woven web of fibers customarily used for the formation of non-woven garment interlinings wherein the area of said web comprises at least one distinct first zone across its width, said zone having at least 10 cm width and running lengthwise and having substantially uniform fiber amount therein, said zone disposed adjacent a second zone having different fiber amount than said first zone, the fibers of said first zone merging into the fibers of said second zone thereby forming a transitional zone between said first zone and said second zone having a fiber amount intermediate said first zone and said second zone, said transitional zone having a width of at least 3 cm.

4,287,247

PACKING LAMINATE PROVIDED WITH CREASE LINES

Wilhelm Reil, Bensheim-Auerbach, and Jörg Trabitzsch, Seeheim-Jugenheim, both of Fed. Rep. of Germany, assignors to Tetra Pak International AB, Lund, Sweden

Filed Sep. 4, 1979, Ser. No. 72,314
Claims priority, application Sweden, Sep. 4, 1978, 7809268
Int. Cl.[3] B32B *3/04;* B29C *17/00;* B29D *3/10*
U.S. Cl. 428—129 16 Claims



1. A packing container wall portion, comprising:
at least two portions of a laminate joined together to form a sealing fin which is folded along a first fold line to overlie an adjacent portion of said laminate and which is also folded substantially 180° against itself along a second fold line which extends transversely to the first fold line; and
at least one auxiliary fold line adjacent and substantially parallel to said second fold line, said at least one auxiliary fold line intersecting said first fold line, wherein said at least one auxiliary fold line assists in said folding of said sealing fin along said second fold line.

6. A packing container wall portion, comprising:
at least two portions of a laminate, including a fibrous carrier layer, an aluminum foil layer and at least one thermoplastic outer layer, said at least two portions of said laminate being joined together to form a sealing fin;
a first fold line in said laminate;
a second fold line in said laminate extending transversely from opposing sides of said first fold line; and
an auxiliary fold line in said laminate disposed adjacent to and substantially parallel to said second fold line and intersecting said first fold line such that after a first substantially 180° fold has been made in said sealing fin along said first fold line, the at least one auxiliary fold line assists in making a second substantially 180° fold in said sealing fin along the second fold line.

10. In a method of forming a packing container from a packing laminate wherein two portions of said laminate are joined together to form a sealing fin which is folded down against one of said portions of said laminate along a first fold line and wherein said sealing fin is subsequently folded against itself along a second fold line which extends transversely to said first fold line, the improvement comprising providing at least one auxiliary fold line in said laminate adjacent and substantially parallel to said second fold line and intersecting said first fold line, said at least one auxiliary fold line assisting in said folding of said sealing fin along said second fold line.

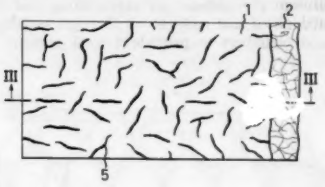
4,287,248

BITUMINIZED ROOF SHEET

Wolfgang Gessner, Kelkheim; Helmut Kuhn, Königstein, and Kurt Plötz, Waldems, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 19, 1979, Ser. No. 50,125
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1978, 2827136
Int. Cl.[3] B32B *3/28, 3/06*
U.S. Cl. 428—137 21 Claims

1. A process for the production of a roof sheet, including a fleece, metal foil and bitumen, which comprises attaching the metal foil to the fleece to obtain a composite structure, thereafter shrinking the fleece from 2 to 35 percent by exposing the attached fleece and foil to hot air, whereby the foil becomes



wrinkled, and bituminizing at least one surface of the composite structure.

4,287,249

TEXTURED SURFACE POLYPROPYLENE FILM

John W. Eustance, So. Glens Falls; Stanley Y. Hobbs, Scotia, and Emilie L. Carley, Hartford, all of N.Y., assignors to General Electric Company, Hudson Falls, N.Y.

Continuation-in-part of Ser. No. 686,831, May 17, 1976, abandoned, which is a division of Ser. No. 554,070, Feb. 28, 1975, abandoned. This application Apr. 16, 1979, Ser. No. 30,236
Int. Cl.[3] B32B *3/26*
U.S. Cl. 428—141 9 Claims

1. An improved flat film with improved surface impregnation properties for dielectric fluids which comprises a thin polypropylene film having one predetermined textured surface which is coextensively and uniformly covered by an overlapping pattern of fibroid irregularities comprising predominantly a stretched layer of Type I and Type II polypropylene crystal structure, and said film being characterized by a space factor of greater than about 5% and a haze measurement of greater than about 20%.

4,287,250

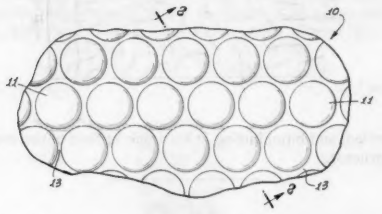
ELASTOMERIC CUSHIONING DEVICES FOR PRODUCTS AND OBJECTS

Marion F. Rudy, Northridge, Calif., assignor to Robert C. Bogert, Woodland Hills, Calif., a part interest

Continuation-in-part of Ser. No. 844,080, Oct. 20, 1977, abandoned. This application Jan. 29, 1979, Ser. No. 7,358
The portion of the term of this patent subsequent to Jan. 15, 1997, has been disclaimed.
Int. Cl.[3] B32B *3/12, 3/06*
U.S. Cl. 428—166 28 Claims

1. A cushioning device exposed to air at atmospheric pressure, comprising opposed layers of permeable elastomeric sheet material surrounded by air at atmospheric pressure, said layers being sealed to each other at predetermined locations to provide a multiplicity of adjacent chambers of predetermined size and shape between said layers, said chambers being inflated with a gaseous medium to a desired initial value, said gaseous medium in said chambers comprising an inert, nonpolar gas other than air, oxygen or nitrogen having a very low solubility coefficient, said layers of sheet material having char-

acteristics of relatively low permeability with respect to said gas to resist diffusion of said gas from said chambers through said layers of sheet material and of relatively high permeability with respect to the ambient air surrounding said layers to permit diffusion of said ambient air through said layers into said inflated chambers to provide a total pressure in each



chamber which is greater that the initial inflation pressure of said gas and is the sum of the partial pressure of the gas in each chamber and the partial pressure of the air in each chamber, the diffusion rate of said gas through said layers of sheet material being substantially lower than the diffusion rate of nitrogen through said layers of sheet material.

4,287,251

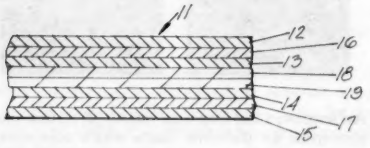
DISPOSABLE ABSORBENT NONWOVEN STRUCTURE

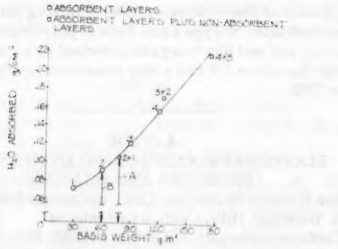
Mary K. King, 301 Leonora Dr., Memphis, Tenn. 38117, and William J. Boyd, 4794 N. Milnor, Memphis, Tenn. 38128

Filed Jun. 16, 1978, Ser. No. 916,298

Int. Cl.[3] **B32B** *27/14;* **D04H** *1/04;* **A61L** *15/00;* **A61F** *13/00*

U.S. Cl. 428—198 **13 Claims**





1. An absorbent nonwoven structure free of added binders comprising alternate layers of nonwoven absorbent material and nonwoven hydrophobic thermoplastic material free of wetting agents, the outermost layers of said structure comprising layers of said nonwoven absorbent material, said structure having a number of said nonwoven absorbent material layers greater by one than the number of said nonwoven hydrophobic thermoplastic material layers, each of said nonwoven thermoplastic layers having a basis weight of from about 5 to about 25 grams per square meter and an open area of at least 40%, said nonwoven absorbent material and thermoplastic material layers of said structure being spot bonded together, each of said alternating thermoplastic layers being of such structure as to provide support for the adjacent ones of said absorbent layers and void volume within itself and between itself and said adjacent ones of said absorbent layers whereby the absorbency of said nonwoven structure is increased.

4,287,252

RECONSTITUTED LEATHER AND METHOD OF MANUFACTURE

Serge Dimiter, Box 341, Poughkeepsie, N.Y. 12602

Continuation-in-part of Ser. No. 80,049, Sep. 28, 1979, abandoned, which is a continuation of Ser. No. 919,474, Jun. 27, 1978, abandoned. This application Sep. 5, 1980, Ser. No. 184,656

Int. Cl.[3] **C08L** *89/06;* **B32B** *3/26, 9/02, 5/18*

U.S. Cl. 428—316 **14 Claims**

1. A reconstituted leather product comprising pulverized leather particles polarized to form aggregates or groups of particles, said aggregates being at least partially encapsulated and bonded one to the others by a resin binder to form a sheet material, said sheet material having buffed surfaces and forming a structure closely simulating natural leather in feel, odor and appearance.

6. The method of making a reconstituted leather composition comprising the steps of pulverizing leather to form fine particles, polarizing said particles to cause them to adhere to form groups of particles or aggregates, binding said aggregates by a resinous binder to form said reconstituted leather and then buffing the surfaces thereof to expose the natural leather particles.

4,287,253

CATALYTIC FILLER FOR ELECTROLESS METALLIZATION OF HOLE WALLS

Edward J. Leech, Oyster Bay, N.Y., assignor to Photocircuits Division of Kollmorgen Corp., Hartford, Conn.

Filed Apr. 8, 1975, Ser. No. 566,611

Int. Cl.[3] **C23C** *3/02*

U.S. Cl. 428—323 **33 Claims**

1. In a process for making a filler material that is catalytic to the deposition of electroless metal, the improvement which comprises the steps:

a. adsorbing a reducible metal compound from a liquid medium comprising said compound on to the surface of a filler material;

b. rendering said adsorbed compound catalytic to the deposition of electroless metal by contacting said adsorbed compound with hydrazine; and

c. incorporating the catalytic filler so formed into the formation of an insulating article.

4,287,254

CONJUGATE FILAMENTS AND FILMS

Emerick J. Dobo, Cary, N.C., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 876,975, Feb. 13, 1978, Pat. No. 4,217,399, which is a division of Ser. No. 629,184, Nov. 5, 1975, Pat. No. 4,089,921. This application Jul. 16, 1979, Ser. No. 58,227

Int. Cl.[3] **B32B** *5/16, 27/08;* **D02G** *3/00*

U.S. Cl. 428—329 **5 Claims**

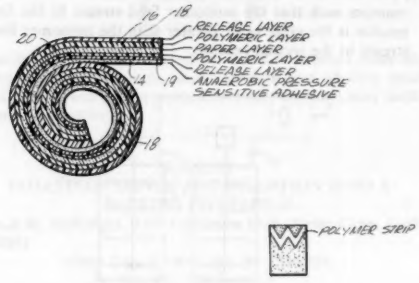
1. A film comprising a first layer of an organic film-forming polymer containing particles of a first reducible metal oxide; an adhering second layer of an organic film-forming polymer containing particles of a second reducible metal oxide; wherein the metal component of each of said first and second reducible metal oxides is sinterable at a temperature which is below the melting point of the other.

4,287,255

REINFORCED ADHESIVE TAPES

K. Lim Wong, Los Angeles, and Gustav A. Schmidt, South Pasadena, both of Calif., assignors to Avery International Corporation, San Marino, Calif.

Filed Sep. 6, 1979, Ser. No. 73,065
Int. Cl.[3] C09U 7/02; C09J 7/02
U.S. Cl. 428—343 9 Claims



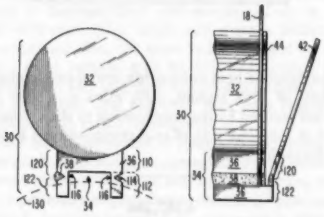
1. A reinforced adhesive stock comprising:
(a) a carrier web;
(b) a release surface on the carrier web;
(c) an adhesive layer comprising an adhesive and a photopolymerizable compound on the release surface; and
(d) at least one radiation-cured polymeric strip of the photopolymerizable compound within the adhesive layer.

4,287,256

WAFER AND BOULE PROTECTION DURING THE BLADE RETURN STROKE OF A WAFER SAW

Robert R. Demers, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 973,458, Dec. 26, 1978, Pat. No. 4,227,348. This application May 30, 1980, Ser. No. 155,999
Int. Cl.[3] B32B 1/04, 7/06, 33/00
U.S. Cl. 428—375 7 Claims



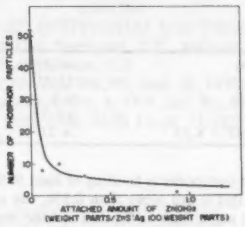
1. An ingot comprising:
a boule of material to be sliced into wafers; and
a support structure bonded to said boule, said support structure having a region of preferential deformation which will preferentially deform when a just-sawn wafer is leaned away from the just-sawn face of said boule.

4,287,257

PHOSPHORS FOR COLOR TELEVISIONS

Susumu Ohmatoi, Fujisawa; Hitoshi Tanaka, Ninomiya, and Seiji Murakami, Minami-ashigara, all of Japan, assignors to Kasei Optonix, Ltd., Tokyo, Japan

Filed Sep. 17, 1979, Ser. No. 76,430
Claims priority, application Japan, Sep. 18, 1978, 53/14365
Int. Cl.[3] C09K 11/10
U.S. Cl. 428—403 13 Claims



1. A phosphor comprising a phosphor for color television and zinc hydroxide attached to the phosphor for color television, the amount of said zinc hydroxide being less than 0.7 part by weight per 100 parts by weight of the phosphor for color television.

4,287,258

PARTICULATE STYRENE POLYMERS CONTAINING BLOWING AGENT

Klaus Hahn, Lampertheim; Hans P. Rath, Gruenstast, and Manfred Walter, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 19, 1980, Ser. No. 188,683
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1979, 2942182
Int. Cl.[3] B32B 9/00
U.S. Cl. 428—407 4 Claims

1. A particulate styrene polymer, containing blowing agent, which is surface-coated with from 0.05 to 1% by weight of a glycerol dialkyl ether.

4,287,259

PREPARATION AND USES OF AMORPHOUS BORON CARBIDE COATED SUBSTRATES

Robert E. Riley; Lawrence R. Newkirk, both of Los Alamos; Flavio A. Valencia, Santa Fe, and Wallace, Sr., Terry C., Los Alamos, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 5, 1979, Ser. No. 100,754
Int. Cl.[3] B32B 9/00
U.S. Cl. 428—408 10 Claims

1. A method of coating graphite cloth with a coating of amorphous boron carbide which is substantially uniform on all filaments throughout each yarn bundle of said cloth, said method comprising: contacting said graphite cloth with a mixture of BCl_3, at least one hydrocarbon selected from the group consisting of propene and methane, and hydrogen at a coating temperature within the range from about 850° to about 900° C. and at a total pressure within the range from about 15 torr to about 35 torr.

4,287,260
CORDIERITE CRYSTAL-CONTAINING GLAZE

Paul D. Prall, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Continuation-in-part of Ser. No. 90,469, Nov. 1, 1979, abandoned. This application Jul. 28, 1980, Ser. No. 172,514

Int. Cl.[3] **B32B** *17/06;* **C03C** *5/00*

U.S. Cl. 428—410 **19 Claims**

1. A low expansion ceramic body having fired thereon a fused glaze which has an oxide composition consisting essentially of

SiO_2	66–75 wt. %
Al_2O_3	13–22
MgO	3–8
B_2O_3	2.5–7
$Na_2O + K_2O$	.4–2.0

the above listed components totaling at least 95% of the composition, and Li_2O is not more than 0.5%, the total of Fe_2O_3 and TiO_2 is not more than 1.5%, and at least one of ZnO and ZnO_2 is included in an amount less than 2%,

said glaze having a ratio $(SiO_2+Al_2O_3+MgO)/(CaO+SrO+BaO+Cs_2O+F_2)$ which is at least about 28:1,

said glaze containing cordierite crystals as the major crystalline phase therein and the exterior of the glaze is richer in SiO_2 than the interior of the glaze.

4,287,261
FABRIC COATING PROCESS AND PRODUCT THEREOF

George C. West, Concord, and William F. Polfus, Rutherfordton, both of N.C., assignors to Reeves Brothers, Inc., Charlotte, N.C.

Continuation of Ser. No. 945,589, Sep. 25, 1978, abandoned. This application Mar. 24, 1980, Ser. No. 133,557

Int. Cl.[3] **B05D** *3/02;* **B32B** *9/04*

U.S. Cl. 428—421 **9 Claims**

1. A process for coating a woven fabric comprising the steps of:

(a) depositing on a taut fabric a coating composition having a viscosity up to about 100,000 cps and consisting essentially of:

(1) a polydimethyl siloxane component present in an amount from about 93 to about 99 percent by weight of the composition, and

(2) A tin catalyst present in an amount from about 0.5 to about 1.5 percent by weight of the composition,

(b) uniformly distributing the deposited coating composition on the surface of the fabric,

(c) curing the fabric from b,

(d) padding the fabric with a solution selected from a silicone or a fluorocarbon solution, and

(e) compressing the fabric, whereby it is substantially wind-resistant, water-repellant, and has a good handle.

4,287,262
PROCESS FOR THE PRODUCTION OF LAMINATE SYSTEMS FROM A LOW DENSITY POLYETHYLENE COATING RESIN

Forest Engelhard, Dormagen; Rainer Kuhn, Odenthal; Wichard Pump, Mülheim; Reinhard Riess, Bergisch-Gladbach, and Hugo Streib, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 30, 1979, Ser. No. 99,146

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1978, 2853069

Int. Cl.[3] **B32B** *15/08*

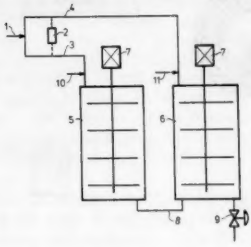
U.S. Cl. 428—461 **6 Claims**

1. Process for the production of laminate systems with improved bond strength by coating flexible substrates using, as the coating resin, low density polyethylene (LDPE) which has been prepared in autoclave reactors with virtually complete back mixing under pressures of 800 to 3,000 bars and in the presence of initiators which form free radicals, characterized in that a low density polyethylene which is obtained if

(a) two autoclaves are connected in series such that all the reaction product of the first reactor is transferred to the second reactor,

(b) a length-/diameter ratio (L/D) of 1:1 to 3:1 is chosen for each autoclave,

(c) The monomer feed stream is distributed between the two reactors such that the monomer feed stream to the first reactor is the same as or greater than the monomer feed stream to the second reactor,



(d) the reaction temperatures in the two autoclaves are adjusted such that the reaction temperature in the first reactor is lower than the reaction temperature in the second reactor,

(e) the initiator chosen for the first reactor is the same as or different from the initiator chosen for the second reactor,

and which has a density of 0.915 to 0.930 g/cm^3 and a melt index (190° C./2,16 kp) of 0.2 to 20 g/10 minutes is employed as the coating resin,

and said flexible substrate is coated with a composition consisting essentially of said low density polyethylene.

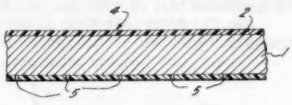
4,287,263
HEAT BONDABLE ASPHALTIC SOUND DEADENER

William J. Woodring, Bound Brook, N.J., and James A. Gulino, Joliet, Ill., assignors to GAF Corporation, New York, N.Y.

Continuation of Ser. No. 905,349, May 12, 1978, abandoned. This application Aug. 15, 1979, Ser. No. 66,612

Int. Cl.[3] **B32B** *11/02, 11/04, 11/08*

U.S. Cl. 428—489 **1 Claim**



1. An automobile heat contouring sound-deadening material made solely of 30% asphalt, 20% mica and 50% limestone composition secured by the composition to the automobile and having on at least one side of said composition a heat deteriorating polyethylene film.

4,287,264
HEAT SENSITIVE COATING

Barry L. Marginean, Scottsville, N.Y., assignor to Labelon Corporation, Canandaigua, N.Y.

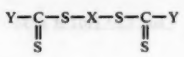
Filed Mar. 7, 1980, Ser. No. 128,195

Int. Cl.[3] **B41M** *5/18, 5/22;* **C09D** *11/10*

U.S. Cl. 428—514 **9 Claims**

1. In a color forming heat sensitive coating composition comprising a color forming amount of a finely divided homog-

enous basic 3,3'-bisarylphthalane derivative and a color developing amount of a finely divided solid phenyl derivative which at thermal printing temperature is at least partly fluidizable and capable of a color forming reaction with said 3,3-bisarylphthalane compound dispersed in a polyvinyl alcohol carrier, wherein the improvement comprises the presence of an anti-sticking amount of a functional filler of the general formula



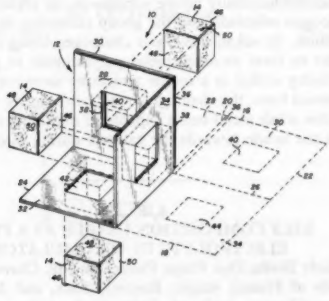
wherein X represents a bond or a metal selected from the group consisting of lead, zinc, cadmium and alkaline earth metal metals and Y represents lower alkyloxy or lower dialkylamino—therefor.

4,287,265

FLOATING CORNER FOR INSERTION INTO A PACKING CONTAINER

Joseph H. McKnight, 2298 Calabazas Blvd., Santa Clara, Calif. 95051

Filed Dec. 2, 1976, Ser. No. 746,701
Int. Cl.³ B65D *81/02*
U.S. Cl. 428—542 **11 Claims**



1. A floating corner which when assembled is for insertion into an outer packing container to protect an object in an inner container, and when disassembled may be stored and shipped compactly, comprising:

a sheet of generally rigid first material having first, second and third intersecting fold lines and a slot substantially linearly aligned with said second fold line, said fold lines and said slot dividing said sheet into first, second, third and fourth portions, each having an opening provided therein, the openings in said first and fourth portions being identical in configuration and positioned so as to be aligned with each other when said sheet is folded along said second fold line, the sheet being adapted to fold so that said third portion may be oriented normal to said second portion and said first and fourth portions may be rotated about said first and third fold lines respectively, into substantially coplanar positions; and

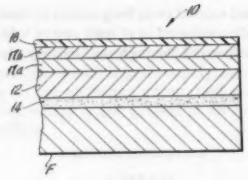
first, second and third blocks of firm, spongy, resilient second material, each having opposed first and second surfaces and a sidewall between said first and second surfaces having a perimeter slightly larger than said openings, each said block being adapted for compressive disposition within one of said openings with said first surface spaced from one surface of said sheet and adapted to contact a wall of an outer container and said second surface spaced from the opposite surface of said sheet and adapted to contact a surface of an inner container, whereby when the corner is assembled by folding said sheet and disposing said blocks through said openings and then is appropriately positioned between an inner container and an outer container, said blocks serve to absorb energy transmitted through the outer container to protect an object carried in the inner container, and when said corner is disassembled for shipment or storage the blocks are separated from the sheet and the sheet is unfolded so that it can be laid flat.

4,287,266

SOLAR SELECTIVE FILM AND PROCESS

James M. Myles, East Northport, N.Y., assignor to Grumman Aerospace Corp., Bethpage, N.Y.

Continuation of Ser. No. 865,298, Dec. 28, 1977, abandoned.
This application Nov. 8, 1979, Ser. No. 92,458
Int. Cl.³ F24J *3/02*; B32B *15/04, 15/18, 15/20*
U.S. Cl. 428—596 **5 Claims**



1. A composite, flexible, solar selective film for use with a solar collector comprising:

a metallic substrate selected from the group consisting of copper, nickel, aluminum and steel, said substrate having opposite major surfaces;

a solar selective coating on one of said major surfaces, said coating having a first layer selected from the group consisting of white chromium and white nickel and having a thickness in the range of 1/10 to ¼ mil and a second outer layer of black chromium having a thickness in the range of 800 to 1600 Angstrom units;

a barrier layer on the surface of said selective coating, said barrier layer containing a corrosion inhibitor; and

adhesive means on the other of said major surfaces for affixing said substrate to said solar energy collector, said adhesive means being capable of withstanding temperatures in the range of 500 to 800° F., said film having slots to accommodate thermal expansion, said slots being a tortuous, ladder-like array, oriented perpendicularly to the primary thermal expansion direction.

4,287,267

ZINC-CHLORINE BATTERY PLANT SYSTEM AND METHOD

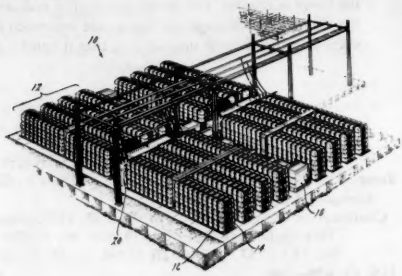
Curtis C. Whittlesey, Birmingham, and Matthew S. Mashikian, Huntington Woods, both of Mich., assignors to Energy Development Associates, Inc., Madison Heights, Mich.

Filed May 27, 1980, Ser. No. 153,094
Int. Cl.³ H01M *2/20*
U.S. Cl. 429—49 **35 Claims**

1. A method of discontinuing the electrical current flow through at least one secondary energy storage battery module in a battery plant having a plurality of battery modules connected in series to form a battery string, a plurality of said battery strings connected electrically in parallel, first switching means for controlling the supply of at least one reactant electrochemically transformed in said battery modules, and second switching means for redirecting the electrical current flow through said battery plant, comprising the steps of:

energizing said first switching means so that the supply of

said reactant in at least one of said battery modules is interrupted; and



energizing said second switching means so that the electrical current is discontinued in at least one of said battery modules and redirected through said battery plant.

4,287,268

ELECTRODE FOR AN ELECTROCHEMICAL CELL, AND AN ELECTROCHEMICAL CELL

Johan Coetzer, Pretoria, South Africa, assignor to The South African Inventions Development Corporation, Pretoria, South Africa

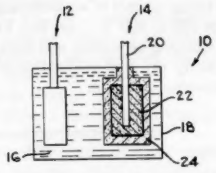
Filed Jul. 17, 1979, Ser. No. 58,145

Claims priority, application South Africa, Jul. 17, 1978, 78/4059; Jul. 17, 1978, 78/4060; Sep. 6, 1978, 78/5064

The portion of the term of this patent subsequent to Aug. 14, 1997, has been disclaimed.

Int. Cl.³ H01M *10/39*

U.S. Cl. 429—103 **35 Claims**



1. An electrochemical cell including a pair of compatible electrodes and a compatible electrolyte, at least one of the electrodes comprising an electrochemically active substance which comprises one or more elements selected from the group consisting of the halogens, the alkali metals, the alkaline earth metals, the first and second series of transition elements, lead, phosphorous, arsenic, antimony, bismuth and aluminium and a zeolite molecular sieve carrier having pore sizes of less than 100 Angtrom units wherein the electrochemically active substance is sorbed and is held in dispersed form in the cavities thereof for effective use in the cell, and the electrochemically active substance being such that any exchangeable cations of the zeolite molecular sieve carrier make a negligible contribution to the cell reaction, and substantially all the power and energy of the cell is provided by the eldctrochemically active substance held in dispersed form in the cavities in the carrier.

4,287,269

ELECTROCHEMICAL CELL AND ANODE FOR AN ELECTROCHEMICAL CELL

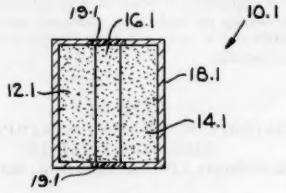
Johan Coetzer, and Michael M. Thackeray, both of Pretoria, South Africa, assignors to The South African Inventions Development Corporation, Pretoria, South Africa

Filed Aug. 29, 1979, Ser. No. 70,898

Claims priority, application South Africa, Sep. 6, 1978, 78/5067

Int. Cl.³ H01M *4/36*

U.S. Cl. 429—103 **19 Claims**



1. An electrochemical cell comprising, in its charged state, an anode, a cathode, and an electrolyte, the anode comprising, as electrochemically active substances, an alkali metal and a chalcogen selected from the group consisting in sulphur and selenium, the alkali metal and chalcogen being combined together to form an alkali metal polysulphide or polyselenide, and being sorbed in a zeolite molecular sieve carrier in finely dispersed form, the chalcogen being held captive in the carrier and the alkali metal being capable of migrating in ionic form from the anode towards the cathode during discharge of the cell.

4,287,270

SALT COMPOSITION USABLE AS A FUSED ELECTROLYTE IN ACCUMULATORS

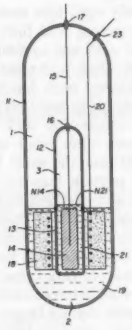
Frederic Breda, Oye Plage; Pierre Jonville, Clermont-Ferrand, both of France; Angelo Bonomi, Onex, and Jack Ambert, Grand-Lancy, both of Switzerland, assignors to Proge Groupement d'Interet Economique, Paris, France

Filed Apr. 24, 1980, Ser. No. 143,289

Claims priority, application France, Apr. 26, 1979, 79 11226

Int. Cl.³ H01M *4/36*

U.S. Cl. 429—103 **8 Claims**



1. An alkali salt composition free from hydroxide, usable in its molten state as an anode electrolyte for accumulators with an alkali metal negative electrode and with an alkali alumina separator, the said composition containing an alkali amide, at least one alkali halide, and an alkali hydride.

5. A secondary electrochemical cell having an alkali metal negative electrode, a positive electrode, an alkali alumina

separator between said electrodes, and between the separator and the negative electrode a molten-salt electrolyte composition comprising an alkali amide, at least one alkali halide, and an alkali hydride.

4,287,271

ELECTROLYTE FOR AN ELECTROCHEMICAL CELL, AND AN ELECTROCHEMICAL CELL INCLUDING THE ELECTROLYTE

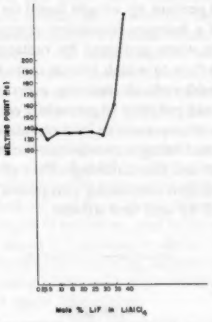
Johan Coetzer; Margaretha J. Nolte, and Annemare de Kock ee Steynberg, all of Pretoria, South Africa, assignors to The South African Inventions Development Corporation, Pretoria, South Africa

Filed Aug. 20, 1980, Ser. No. 179,729

Claims priority, application South Africa, Aug. 22, 1979, 79/4430

Int. Cl.³ H01M *4/36*

U.S. Cl. 429—103 **23 Claims**



1. An electrolyte for use as a molten salt electrolyte in an electrochemical cell, and which comprises:

aluminium cations;

alkali metal cations selected from the group consisting in lithium cations, a mixture of lithium and potassium cations and a mixture of sodium and potassium cations; and

halide anions comprising a mixture of chloride and fluoride anions;

the proportions of the constituents of the electrolyte being selected such that the relative quantities of said aluminium, alkali metal and halide ions conform substantially with the stoichiometric product:

$$MAlX_4$$

wherein:

M represents said alkali metal cations; and

X represents said halide anions,

the proportions of the alkali metal cations and the halide anions making up said stoichiometric product being such that the melting point of the electrolyte at atmospheric pressure is below 140° C.

10. An electrochemical cell having a molten salt electrolyte as claimed in claim **1**, coupled together with a compatible anode and a compatible cathode.

4,287,272

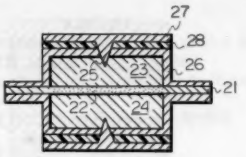
CELL SEPARATOR AND CELL

Sueo Machi, Takasaki; Isao Ishigaki, Maebashi; Takanobu Sugo, Gunma; Toshio Okada, Kadoma; Kazuo Murata, Takatsuki; Shiro Tanso, Takatsuki, and Keizi Senoo, Takatsuki, all of Japan, assignors to Japan Atomic Energy Research Inst., Tokyo and Yuasa Battery Co. Ltd., Osaka, both of, Japan

Filed Apr. 21, 1980, Ser. No. 142,621

Int. Cl.³ H01M *2/16*

U.S. Cl. 429—144 **3 Claims**



1. A cell separator made of a grafted membrane comprising a polyethylene film which is graft-copolymerized with a monomer having an ion exchange group, said grafted membrane having an area which is not grafted at all or an area of low degree of grafting.

4,287,273

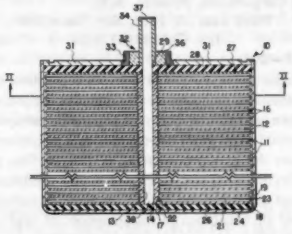
PLURAL CELL BATTERY STRUCTURE

David E. Harney; Marilyn J. Harney, both of Painesville, Ohio, and Matthew O'Boyle, Timonium, Md., assignors to Catalyst Research Corporation, Baltimore, Md.

Filed Apr. 3, 1980, Ser. No. 136,935

Int. Cl.³ H01M *6/14*

U.S. Cl. 429—153 **9 Claims**



1. A primary battery comprising:

A. an electrically conductive encasement means having a base portion, said base portion including a first insulating means;

B. a stacked array of cells extending from said first insulating means to the top of the encasement means, each of said cells consisting essentially of an anode and a pelletized depolarizer, said depolarizer being in direct contact without any separating layer, except an in situ formed electrolytic layer, with said anode and the anode of an adjacent cell, said anode and depolarizer of each cell being relatively positioned so that said cell is in electrical contact with the inner surface of said encasement means through said depolarizer of each cell;

C. a second insulator means positioned substantially coextensively over said array;

D. means for electrically connecting each of said anodes in parallel; and

E. an electrically conductive top means sealingly attached to said encasement means and including a terminal electrically insulated therefrom, said terminal being electrically connected to said means for electrically connecting each of said anodes.

4,287,274

COMPOSITE FLEXIBLE FILM LAMINATE

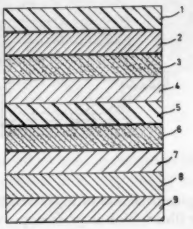
Peter Ibbotson, Wigan; John C. Smith, St. Helens, and Colin Frodsham, Warrington, all of England, assignors to Pakcel Converters Limited, Merseyside, England

Filed Sep. 26, 1979, Ser. No. 79,061

Claims priority, application United Kingdom, Oct. 3, 1978, 39153/78

Int. Cl.[3] H01L *31/00*

U.S. Cl. 429—156 10 Claims



1. A laminate film comprising a first layer of a plastics material, a second layer of discrete areas of coloured pigments, a third layer of adhesive, a fourth layer of a metallic deposit on the surface of a fifth layer, said fifth layer being of a plastics material, a sixth layer of adhesive, a seventh layer of a clay based coating on an eighth layer, said eighth layer being paper and a ninth layer of uncured adhesive.

4,287,275

ALKALINE CELL WITH GRAFT POLYMER SEPARATOR

William J. Davis, Wyomissing, Pa., assignor to Sac Membrane Products Corporation, Syosset, N.Y.

Filed Jan. 26, 1979, Ser. No. 6,909

Int. Cl.[3] H01M *6/04*

U.S. Cl. 429—206 12 Claims

1. An alkaline cell, which comprises a positive electrode, a negative electrode, an aqueous alkaline electrolyte, and a separator between said electrodes, said separator comprising a cast sheet of a crosslinked graft copolymer of a polymeric substrate selected from the group consisting of polyolefins, polyamides and poly(vinylhalides) and an ethylenically unsaturated monomer, said cast sheet having been prepared by solvent removal from a layer of a thixotropic suspension of said crosslinked graft copolymer in an organic solvent.

4,287,276

ALKALINE BATTERY WITH SEPARATOR OF HIGH SURFACE AREA

Joseph T. Lundquist, Jr., Columbia, and Christian B. Lundsager, Ashton, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Jun. 8, 1979, Ser. No. 46,990

Int. Cl.[3] H01M *6/04*

U.S. Cl. 429—206 13 Claims

1. In an alkaline battery system having positive electrodes, negative electrodes, an alkaline electrolyte and separator membrane positioned between positive and negative electrode pairs, wherein the improvement comprising separator membranes, each having a thickness of less than about 10 mils and formed from an admixture of from 7 to 30 weight percent polyolefin having an average molecular weight of at least 100,000; from 0 to 15 weight percent plasticizer; and from 50 to 93 weight percent of a filler selected from titania, alumina, magnesium hydroxide or calcium hydroxide, said filler having a surface area of from 100 to 385 m^2/cc and a pore volume of at least 0.075 cc/gm.

4,287,277

HOLOGRAM RECORDING MATERIAL

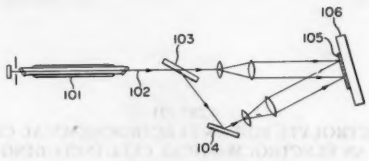
Masakazu Matsumoto, and Katsuhiko Nishide, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 819,584, Jul. 27, 1977, Pat. No. 4,172,724. This application May 29, 1979, Ser. No. 43,245

Claims priority, application Japan, Jul. 27, 1976, 51-89488

Int. Cl.[3] G03C *5/04, 5/00*

U.S. Cl. 430—2 7 Claims



1. A relatively thin member of 2 to 20 microns thick for use as a volume type phase hologram for coherent optical processing adapted to provide enhanced diffraction efficiency, higher resolving power, and, stability against moisture and light consisting essentially of: a crosslinkable composition of:

(a) a polymer containing in its unit structure an aromatic or heterocyclic ring having therein a reactive position capable of being substituted by a radical and;

(b) 0.1 to 200 percent by weight based on the weight of the polymer of a halogen-containing compound for generating radicals when activated by radiation rays having at least one carbon to which two or more halogen atoms are attached, said radicals causing a cross-linking reaction involving said polymer to provide a cross-linked product in response to exposure to said radiation rays, said cross-linked product being responsive to the swelling effect of a first solvent and the shrinking effect of a second solvent, and said halogen containing compound being adapted to be dissolved by said first solvent.

4,287,278

TWO SUPERIMPOSED ION CURRENT FORMED IMAGES USING PHOTOCONDUCTIVE SCREEN GIVES WIDER POTENTIAL RANGE FOR GRADATION CONTROL IN ELECTROPHOTOGRAPHY

Tatsuo Ohta; Sohji Shinozaki; Syusaku Yoshida, and Hideo Ohba, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1980, Ser. No. 132,521

Claims priority, application Japan, Mar. 27, 1979, 54-35039

Int. Cl.[3] G03G *13/052*

U.S. Cl. 430—53 6 Claims

1. A method for forming an electrostatic latent image of an original on an image recording material comprising the steps of:

forming a primary electrostatic latent image on a photoconductive layer of a screen-type photosensitive plate;

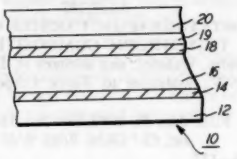
forming a secondary electrostatic latent image on the image recording material by irradiating the recording material with a charged particle current passed through the screen-type photosensitive plate carrying the primary latent image; and

correcting the secondary electrostatic latent image on the recording material by irradiating the recording material bearing the secondary latent image with a charged particle current passed through the screen-type photosensitive plate carrying the primary latent image.

4,287,279
OVERCOATED INORGANIC LAYERED PHOTORESPONSIVE DEVICE AND PROCESS OF PREPARATION

George A. Brown, Penfield; Lloyd A. Relyea, Webster; Merlin E. Scharfe, and Heinz W. Pinsler, both of Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 5, 1980, Ser. No. 127,176
Int. Cl.[3] G03G 5/082, 5/14
U.S. Cl. 430—58 4 Claims

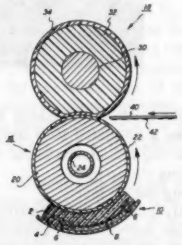


1. A layered inorganic photoresponsive device comprised of
(a) a substrate having a thickness of from about 5 mils to about 100 mils;
(b) a layer of hole injecting material capable of injecting holes into a layer on its surface, this layer being comprised of trigonal selenium, and ranging in thickness of from about 0.5 microns to about 10 microns;
(c) a hole transport layer in operative contact with the hole injecting layer, this layer beng comprised of a halogen doped selenium arsenic alloy, wherein the percentage by weight of selenium present is from about 99.5 percent to about 99.9 percent, the percentage by weight of arsenic present is from about 0.1 percent to about 0.5 percent, and the halogen is present in an amount of from 10 parts per million to about 200 parts per million, this layer ranging in thickness of from about 5 microns to about 60 microns;
(d) a charge generating layer overcoated on the hole transport layer comprised of an alloy of selenium and tellurium, containing from about 70 percent to about 90 percent by weight of selenium, and from about 10 percent to about 30 percent by weight of tellurium, said layer ranging in thickness of from about 0.1 microns to about 5 microns; and
(e) a layer of electrically insulating organic resin overlaying the charge generating layer, said layer having a thickness of from 5 microns to about 25 microns.

4,287,280
RELEASE AGENT APPLICATORS AND METHOD OF APPLYING RELEASE AGENT EMULSIONS UPON FUSERS IN ELECTROSTATIC COPIERS

Joseph A. Swift, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 27, 1979, Ser. No. 52,385
Int. Cl.[3] B44D 1/094; G03G 13/20, 15/20; B05C 11/00
U.S. Cl. 430—99 28 Claims



1. A method for preventing the offset of toner powder to a heated surface used to fix the toner powder to a substrate when the substrate is in pressure engagement with the heated surface comprising applying to the heated surface a high viscosity release agent liquid by continuously replenishable applicator means in contact with the heated surface, said applicator means in contact with a reservoir of a low viscosity emulsion of the high viscosity release agent and an inert vaporizable dispersion liquid for supplying and transporting said high viscosity release agent liquid to the heated surface.

4,287,281
MAGNETIC TONER COMPOSITION AND A METHOD OF MAKING THE SAME

Robert D. Bayley, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 22, 1979, Ser. No. 86,974
Int. Cl.[3] G03G 15/08
U.S. Cl. 430—107 8 Claims

1. A magnetic toner composition comprising particles, said particles comprising resin and magnetic particles dispersed within the resin, said magnetic particles being of two types, the first type having hydrophilic surface characteristics and the second type having hydrophobic surface characteristics.

4,287,282
COMPOSITE MAGNETIC DEVELOPER

Nobuhiro Miyakawa, Kobe, and Takashi Teshima, Amagasaki, both of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Filed Jan. 10, 1980, Ser. No. 110,821
Claims priority, application Japan, Jan. 11, 1979, 54/1013
Int. Cl.[3] G03G 9/00; C04B 35/04
U.S. Cl. 430—107 7 Claims

1. A composite magnetic developer which consists essentially of a homogeneous intimate mixture comprising a plurality of electrically insulating magnetic particulate developers, each developer comprising a binder medium and a finely divided magnetic material dispersed in the binder medium, wherein the difference of the dielectric constant (ϵ), as measured under conditions of an electrode spacing of 0.65 mm, an electrode sectional area of 1.43 cm^2 and an inter-electrode load of 105 g/cm^2, between said developers is in the range of from 0.2 to 0.85.

4,287,283
IRON POWDER DEVELOPING CARRIER AND THE MANUFACTURING METHOD OF THE SAME, DEVELOPER CONTAINING SAID CARRIER AND METHOD OF FORMING VISIBLE IMAGE BY USING SAID DEVELOPER

Shotaro Watanabe, Machida; Makoto Tomono, Hino; Goichi Yamakawa, Hachioji; Takeo Nishimura, Kawaguchi, and Nobuo Takahashi, Tokyo, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1978, Ser. No. 882,101
Claims priority, application Japan, Mar. 9, 1977, 52-25553
Int. Cl.[3] G03G 9/10
U.S. Cl. 430—108 2 Claims

1. An iron powder, useful as a developing carrier for developing an electrostatic latent image, having an apparent density of from 1.5 to 2.5 g/cm^3 made by the method comprising the steps of: sintering a raw iron powder, that has been ground to a particle size of not larger than 50 microns in diameter, without using any binder agent at a temperature of from 900°–1200° C. to form a sintered body; grinding and classifying said sintered body into an intermediate iron powder having a particle diameter of from 50 to 200 microns; then treating said intermediate iron powder to oxidize it at a temperature of from 300° to 370° C., so that an oxidized film is coated on the surface of the iron powder; and adjusting the resultant iron powder so as to have an apparent density of from 1.5 to 2.5 g/cm^3.

4,287,284

METHOD OF IMAGINING USING POSITIVE TONERS CONTAINING ALKYL MORPHOLINIUM COMPOUNDS

Chin H. Lu, and Peter F. Erhardt, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 19,693, Mar. 12, 1979, Pat. No. 4,264,702.
This application Apr. 14, 1980, Ser. No. 139,930
Int. Cl.[3] G03G *13/08, 13/14*
U.S. Cl. 430—120 9 Claims

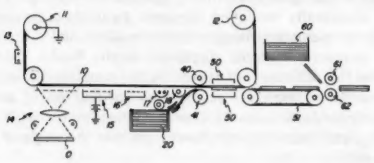
1. A method of imaging comprising forming an electrostatic latent image on a photoreceptor, which photoreceptor has been charged negatively, followed by contacting the image so formed with a developer composition comprising a resin material selected from a styrene butyl methacrylate resin, or a styrene butadiene resin, carbon black, a carrier material consisting of a steel core coated with a polyvinylidene fluoride resin, and a charge control additive selected from N-lauryl N-methyl morpholinium bromide, N-lauryl N-methyl morpholinium chloride, N-cetyl N-methyl morpholinium chloride, N-lauryl N-ethyl morpholinium chloride, or or N-cetyl N-ethyl morpholinium bromide, followed by subsequently transferring the developed latent image to a substrate, and permanently affixing the image thereto.

4,287,285

METHOD AND APPARATUS FOR FABRICATING PERSONAL IDENTIFICATION DOCUMENTS

Michael W. Mosehauer, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 952,423, Oct. 18, 1978, abandoned.
This application Dec. 17, 1979, Ser. No. 104,473
Int. Cl.[3] G03G *13/16, 13/22*
U.S. Cl. 430—124 3 Claims



1. A method of personalizing a core substrate of the type containing general authenticating information, said method comprising the steps of:

(a) electrophotographically forming an electrostatic image of a visually identifiable personal feature on a photoconductive surface of an imaging member;

(b) liquid developing said electrostatic image with toner particles in the size range from about 0.1 micron to about 1.0 micron; and

(c) thermally transferring said developed toner image directly from said photoconductive surface to such a core substrate, said transferring step comprises passing the imaging member and such core substrate between the nip of a pair of transfer rollers with the toner image contacting the transfer member, the roller contacting said photoconductor being heated to a temperature greater than about 40° C. and the roller contacting said core substrate being unheated.

4,287,286

TONER REPELLANT COATING FOR DIELECTRIC FILM

Herman Burwasser, Boonton, N.J., assignor to GAF Corporation, New York, N.Y.

Filed May 25, 1979, Ser. No. 42,433
Int. Cl.[3] G03G *21/00*
U.S. Cl. 430—127 4 Claims

1. A method for substantially preventing unwanted toner pick up on an electroreprographic imaging element having a film support layer, a conductive layer on said support, and a dielectric layer on said conductive layer, said method comprising application to the uncoated side of said film support an antistatic coating capable of substantially eliminating static electrical charges on the antistatically coated side of the film, said antistatic coating comprising a material selected from the group consisting of inorganic salts, resinous polymers of quaternary ammonium salts, homopolymers and copolymers of vinyl organic quaternary ammonium compounds and esters thereof.

4,287,287

ELECTROSTATOGRAPHIC CARRIER COATED WITH THIXOTROPIC COMPOSITIONS

Steven B. Bolte, Webster, and Richard B. Lewis, Williamson, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 28, 1980, Ser. No. 116,066
Int. Cl.[3] G03G *9/00, 9/10*
U.S. Cl. 430—137 4 Claims

1. An improved process for preparing coated electrostatographic carrier particles, for use in developing compositions employed in the development of electrostatic latent images in an electrophotographic imaging device, comprising coating carrier core particles selected from the group consisting of iron, steel, ferrite, magnetite, nickel, and mixtures thereof, which particles have an average diameter of between about 30 microns and about 1,000 microns, by spray drying onto said particles a thixotropic coating lacquer comprised of fumed silica particles, in an amount of from about 0.05 percent to about 3.0 percent by weight based on the weight of the coated carrier particles, whereby the properties of the fumed silica particles cause a reduction in the penetration of such particles into the pores of the carrier core particles, thereby producing particles of a stable triboelectric charge.

4,287,288

LITHOGRAPHIC PLATE OF TIN-PLATED STEEL AND METHOD OF MANUFACTURE

Marcel Pigeon, Neuilly sur Seine, and Yannick de Maquille, Paris, both of France, assignors to Rhone-Poulenc-Graphic, Aubervilliers, France

Filed Feb. 8, 1979, Ser. No. 10,398
Claims priority, application France, Feb. 15, 1978, 78 04213
Int. Cl.[3] G03F *7/08, 7/10;* G03C *1/74;* B41N *1/10*
U.S. Cl. 430—169 12 Claims

1. A continuous method of making a presensitized lithographic plate from a tin-plated steel support wherein the tinplate is a layer having a thickness in the range of from 1 to 10 microns comprising the steps of:

(a) depassivating the tin layer,

(b) continuously plating the depassivated tin layer of the tin-plated steel support in an electrolytic chromium bath having a temperature in the range of from 20° C. to 45° C. without cutting off the current in the electrolytic chromium bath to thereby obtain a hydrophilic dull chromium layer, and

(c) coating the hydrophilic chromium layer with a photosensitive product capable of being made oleophilic by photoexposure and development.

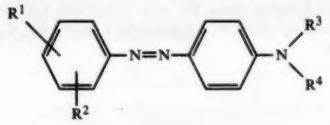
4,287,289

PHOTORESIST CYCLIZED RUBBER AND BISAZIDE COMPOSITIONS CONTAINING A MONOAZO PHOTOEXTINCTION AGENT

Takayuki Sato, Yokosuka, Japan, assignor to Tokyo Ohka Kogyo Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 19, 1979, Ser. No. 49,613
Claims priority, application Japan, Sep. 8, 1978, 53-109814
Int. Cl.³ G03C *1/70, 1/71*
U.S. Cl. 430—196 **9 Claims**

1. A photoresist composition which comprises a cyclized rubber and a bisazide compound as the principal ingredients and 0.5 to 15% by weight based on said rubber of a photoextinction agent which is a compound represented by the general formula



in which R^1 is a lower alkoxy group having from 1 to 6 carbon atoms, R^2 is a hydrogen atom or a lower alkyl group having from 1 to 4 carbon atoms and R^3 and R^4 are each a lower alkyl group having at least 2 carbon atoms or an aralkyl group, as a photoextinction agent.

4,287,290

PROCESS FOR PRODUCING POLYMERIC IMAGE BY DIFFUSION STEP

Masayoshi Mizuno, Mishima, and Hiroyuki Tsuchiya, Fuji, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 31, 1980, Ser. No. 135,842
Claims priority, application Japan, Apr. 5, 1979, 54-41342
Int. Cl.³ G03C *5/54, 5/00*
U.S. Cl. 430—205 **11 Claims**

1. A process for producing a polymeric image by selectively polymerizing a layer of an addition-polymerizable material comprising at least one addition-polymerizable unsaturated compound only in predetermined portions of the layer to provide polymerized portions and unpolymerized portions and removing the unpolymerized portions of the layer, which process comprises the steps of:

(1) treating an image-wise light-exposed layer of a photographic silver halide emulsion with a treating solution having a reducing capacity, said treating solution having a capacity for initiating the polymerization of an addition-polymerizable unsaturated compound and a capacity for reducing the silver halide contained in the silver halide emulsion layer into metallic silver and having a property that it loses said capacity for initiating the polymerization of the addition-polymerizable unsaturated compound once it is used for the reduction of the silver halide, wherein said treating solution comprises an aqueous solution containing a developing agent for the photographic silver halide emulsion, an anti-oxidizing agent and an alkali;

(2) transferring or diffusing said treating solution from the silver halide emulsion layer into a layer of an addition-polymerizable material comprising at least one addition-polymerizable unsaturated compound to polymerize the addition-polymerizable material layer selectively in its portions corresponding to the light-unexposed portions of the silver halide emulsion layer in which the treating solution remains unreacted through the step (1), providing polymerized portions and unpolymerized portions; and

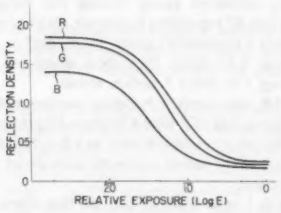
(3) removing the unpolymerized portions.

4,287,291

DIFFUSION TRANSFER COLOR PHOTOGRAPHIC FILM UNIT

Kaoru Onodera, Hino, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1979, Ser. No. 96,311
Claims priority, application Japan, Nov. 23, 1978, 53-147692
Int. Cl.³ G03C *1/40, 1/10, 5/54, 1/28*
U.S. Cl. 430—218 **10 Claims**



1. In a diffusion transfer color photographic film unit comprising a silver halide developing agent and a fogging agent and, at the same time, containing the following components therein

(a) a support having thereon at least one internal latent image type direct positive photosensitive silver halide emulsion layer in combination with a non-diffusible dye releasing redox compound,

(b) an image receiving layer, and

(c) an alkaline processing composition and a means for spreading said processing composition inside the film unit,

the improvement comprising the alkaline processing composition containing an unsubstituted saturated aliphatic or unsubstituted alicyclic monohydric alcohol having 3 to 10 carbon atoms.

4,287,292

PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING NOVEL NONDIFFUSIBLE 6-ARYLAZO-3-PYRIDINOL MAGENTA DYE-RELEASING COMPOUNDS AND PRECURSORS THEREOF

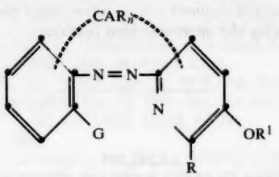
Derek D. Chapman, and James A. Reczek, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 1, 1980, Ser. No. 174,406
Int. Cl.³ G03C *1/40, 1/10, 7/00, 5/54*
U.S. Cl. 430—222 **31 Claims**

17. In a photographic assemblage comprising:

(a) a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material; and

(b) a dye image-receiving layer; the improvement wherein said dye image-providing material is a nondiffusible compound having a releasable 6-arylazo-3-pyridinol magenta dye moiety or precursor thereof, said compound having the formula



wherein:

(a) R represents hydroxy or amino;

(b) R^1 represents hydrogen, a hydrolyzable moiety or CAR;

(c) G represents carboxy; a hydrolyzable ester group having the formula $COOR^2$, wherein R^2 is an alkyl or substituted alkyl group having 1 to about 8 carbon atoms or an aryl or substituted aryl group having 6 to about 10 carbon atoms; or a sulfamoyl group having the formula SO_2NHR^3 wherein R^3 represents hydrogen, alkyl or substituted alkyl having 1 to about 8 carbon atoms, aryl or substituted aryl having 6 to about 10 carbon atoms, or an acyl group having 1 to about 8 carbon atoms;

(d) CAR represents a ballasted carrier moiety capable of releasing said diffusible 6-arylazo-3-pyridinol magenta dye moiety or precursor thereof as a function of development of said silver halide emulsion layer under alkaline conditions; and

(e) n is 0, 1 or 2, with the proviso that when n is 0, then R^1 is CAR;

and wherein the phenyl ring illustrated above may not be substituted with a nitro group.

4,287,293

PHOTOGRAPHIC ELEMENT

Tamotsu Iwata, and Shigeru Iguchi, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Jan. 8, 1980, Ser. No. 110,751

Claims priority, application Japan, Jan. 18, 1979, 54-4250

Int. Cl.³ G03C *5/54, 1/72*

U.S. Cl. 430—232 **12 Claims**

1. A photographic element having a photographic layer containing a conversion mixture of a polyvinyl alcohol having a saponification degree of 98% or more and an ethylene-maleic anhydride copolymer.

5. A photographic element of claim **1**, wherein the photographic layer is an image receiving layer of the silver complex diffusion transfer element.

4,287,294

METHOD FOR THE PREPARATION OF RELIEF STRUCTURES BY PHOTOTECHNIQUES

Roland Rubner, Röttenbach; Eberhard Kühn, Hemhofen, and Hellmut Ahne, Röttenbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 9, 1980, Ser. No. 148,129

Claims priority, application Fed. Rep. of Germany, May 16, 1979, 2919841

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—306 **6 Claims**

1. In a method for the preparation of relief structures by phototechniques wherein a mixture of (i) a photo-or radiation-reactive olefinically unsaturated polymer and (ii) as a photoinitiator, an azide is applied in the form of a layer or foil to a substrate; the layer or foil is exposed or irradiated through a mask; and the non-exposed or non-irradiated portions of the layer or foil are removed from the substrate to obtain a relief structure, the improvement comprising utilizing as said photoinitiator an aromatic azidomaleinimide.

4,287,295

IMAGE FORMING METHOD AND APPARATUS THEREFOR

Kohei Nonaka, Yokohama; Masahiro Koyama, Kawasaki; Makoto Gonmori, Tokyo; Takeo Kimura, and Tetsuo Shiga, both of Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 2, 1979, Ser. No. 63,306

Claims priority, application Japan, Aug. 11, 1978, 53-98524; Jun. 22, 1979, 54-78688

Int. Cl.³ G03C *1/02*

U.S. Cl. 430—349 **12 Claims**

1. In an image forming method for forming a visible image using an image forming sheet containing at least an organic silver salt oxidizing agent, a reducing agent for silver ion and a binder, which sheet is normally non-photosensitive but can be rendered photosensitive by preheating prior to exposure; and wherein said image forming sheet is preheated to render it photosensitive, is exposed to a light image to form therein a latent image and then is heat-developed to form a visible image; the improvement comprising, after preheating an area of the image forming sheet, the step of cooling said area of the image forming sheet to a temperature below 60° C. prior to exposure.

4,287,296

DIRECT-POSITIVE EMULSION CONTAINING FOGGED, SILVER HALIDE GRAINS OF SILVER IODIDE CONTENT

Willy J. Vanassche, Kontich; Herman A. Pattyn, Kapellen, both of Belgium; Erik Moisar, Köln-Flittard, and Sieghart Klötzer, Cologne, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Nov. 20, 1973, Ser. No. 417,497

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1972, 2263246

Int. Cl.³ G03C *5/24, 1/36*

U.S. Cl. 430—411 **14 Claims**

1. Photographic material comprising at least one layer of a direct-positive radiation-sensitive emulsion containing fogged silver halide grains, wherein the silver halide grains are heterodisperse and irregular and have a grain size distribution so that at least 10% by weight of the silver halide grains have a diameter, which deviates for at least 40% from the mean grain diameter and wherein the silver halide of the grains has a silver iodide content of more than 10 mole % and at most about 20 mole % relative to the total amount of silver halide.

4,287,297

LIQUID COMPOSITION FOR TREATING PHOTOSENSITIVE LAMINATES HAVING ALCOHOL-SOLUBLE POLYAMIDE LAYER

Tetsuo Ishihara, Itami, and Keizi Kubo, Amagasaki, both of Japan, assignors to Daicel Chemical Industries Ltd., Osaka, Japan

Filed Mar. 3, 1980, Ser. No. 126,600

Claims priority, application Japan, Mar. 9, 1979, 54-27522

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—435 **7 Claims**

1. A liquid composition for treating photosensitive laminates having an alcohol-soluble polyamide layer formed on a substrate, which comprises 12 to 70 parts by weight of an aromatic neutral salt selected from X,Y,Z-substituted benzenes and X,Y,Z-substituted naphthalenes in which X is a group selected from COONa and SO_3Na, Y is a group selected from H, OH, NH_2 and COONa and Z is a group selected from H, CH_3 and OH, 0.01 to 10 parts by weight of an alkali, 1 to 15 parts by weight of alcohol and 84 to 100 parts by weight of water.

4,287,298

FILM BASE MATERIAL CONTAINING A COMBINATION OF SURFACTANTS

Geoffrey M. Dodwell, Brentwood, England, assignor to Ciba-Geigy AG, Basel, Switzerland

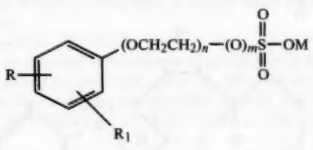
Division of Ser. No. 935,397, Aug. 21, 1978, Pat. No. 4,244,988, which is a continuation of Ser. No. 777,285, Mar. 11, 1977, abandoned. This application Feb. 6, 1980, Ser. No. 119,067

Claims priority, application United Kingdom, Apr. 14, 1976, 15165/76

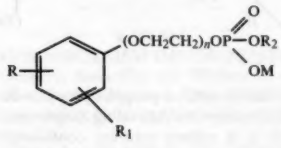
Int. Cl.³ G03C *1/78*

U.S. Cl. 430—533 **8 Claims**

1. A process for the preparation of silver halide photographic material which comprises preparing an uniaxially oriented film of synthetic linear polyester of highly hydrophobic character, coating as a layer on this film an aqueous latex of a copolymer which comprises from 60 to 90 mole % vinylidene chloride, from 7 to 20 mole % alkyl acrylate or methacrylate, from 0 to 3 mole % copolymerisable acid and from 5 to 20 mole % of an allyl, methallyl or vinyl monomer which comprises an active halogen group an active methylene group the copolymerisation taking place in the presence of a mixture of an anionic surfactant which is either an alkyl aryl polyester sulphate or sulphonate of the formula

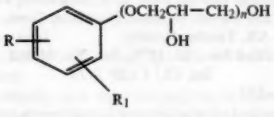


or an alkyl aryl polyether phosphate of the formula

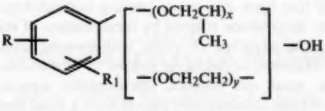


wherein R is alkyl of 6 to 10 carbon atoms, R_1 is hydrogen or alkyl of 1 to 5 carbon atoms, M is hydrogen, an alkali metal or ammonium, R_2 is hydrogen, an alkali metal, ammonium or alkyl of 1 to 5 carbon atoms, m is 0 or 1 and n is 3 to 15,

and a nonionic surfactant which is an alkyl aryl polyalkylene oxide containing at least some polypropylene oxide derived units of the formula



or of the formula



where R is alkyl of 6 to 10 carbon atoms, R_1 is hydrogen or alkyl of 1 to 5 carbon atoms, n is 3 to 15, x is 1 to 4 and y is 3 to 10, the proportions of nonionic to anionic surfactant being from 5 to 50 by weight up to 20 to 50 by weight, the total amount of surfactant present in the aqueous medium being up to 2% W/V of the monomers used, then drying the coated layer and completing the orientation to obtain a biaxially oriented polyester film and then coating on to the dried copolymer layer a gelatino silver halide emulsion layer and drying the silver halide emulsion layer.

4,287,299

PROCESS FOR THE PRODUCTION OF MATTING LAYERS

Wolfgang Himmelmann; Rolf Brück; Wolfgang Sauerteig, all of Leverkusen; Peter Kruck, Cologne; Günter Kolb, and Günter Sackmann, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed May 13, 1980, Ser. No. 149,496

Claims priority, application Fed. Rep. of Germany, May 16, 1979, 2919822

Int. Cl.³ G03C *1/76*

U.S. Cl. 430—537 **5 Claims**

1. In a process for producing photographic material having a supported layer containing particles of a narrow grain size distribution, stable in alkaline solutions to provide a matt surface,

the steps of providing a dispersion for the layer comprising,

providing a layer cast as a surface layer of the photographic material, including casting as the surface layer a composition consisting essentially of a hydrophilic colloid and 1–15% by weight of the dispersion polymer particles dispersed in the colloid, said polymer dispersion being obtained by forming a finally divided copolymer suspension of spherical particles of a substantially alternating and equimolecular grouped suspension copolymer of maleic acid anhydride and C_2–C_8 monoolefin having a particle size from 1 to 10μ

dispersing said particles in a aqueous solution of a hydrophilic colloid in a quantity of from 1 to 15% by weight, based on the weight of the dispersion.

4,287,300

CHARGE EFFECTS IN ENZYME IMMUNOASSAYS

Ian Gibbons, Menlo Park; Gerald L. Rowley, Cupertino, and Edwin F. Ullman, Atherton, all of Calif., assignors to Syva Company, Palo Alto, Calif.

Filed Jul. 26, 1979, Ser. No. 61,099

Int. Cl.³ C12Q *1/70*; G01N *33/54*; C12N *9/96*

U.S. Cl. 435—5 **15 Claims**

1. A method for determining the presence of an analyte in a sample suspected of containing said analyte, said analyte being a member of a specific binding pair consisting of ligand and antiligand, wherein a detectible signal is obtained related to the amount of analyte by employing a signal producing system comprising an enzyme labeled specific binding member and a polyionic charged specific binding member having sufficient charge to attract an oppositely charged macromolecular substrate or cofactor, where the detectible signal level is related to the average proximity of said charged member to said enzyme labeled member, said method comprising:

combining in an aqueous assay medium;

(1) said sample;

(2) said charged specific binding member;

(3) said enzyme labeled specific binding member;

(4) substrates and cofactors for said enzyme wherein at least one substrate or cofactor for said enzyme is a charged macromolecular of opposite charge from said polyionic charged member,

wherein at least one of (1), (2) and (3) is ligand and at least one of the remaining of (1), (2) and (3) is antiliand, so that a complex may be formed between said charged specific binding member and said enzyme labeled specific binding member; and

determining the detectible signal produced by said enzyme

as compared to the signal produced in an assay medium having a known amount of analyte.

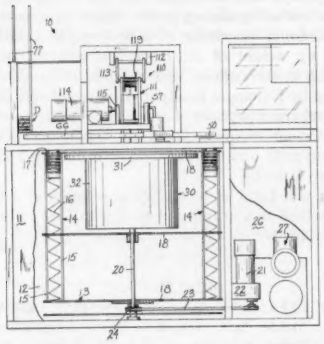
7. A composition useful for the immunoassay of claim 1 comprising, a macromolecular charged substrate or coenzyme and modified members of a specific binding pair consisting of ligand and antiligand, wherein the modified members are an enzyme labeled member and a charged member substituted with a plurality of functionalities which under the conditions of the assay are sufficiently charged opposite to said charged macromolecular substrate or cofactor to attract said charged macromolecular substrate or cofactor, the relative amounts of said charged member and said enzyme-labeled member substantially optimize the response of the detectible signal level to variations in analyte concentration.

4,287,301

METHOD AND APPARATUS FOR STREAKING AGAR

Thomas W. Astle, 607 Harbor View Rd., Orange, Conn. 06477

Filed Apr. 21, 1976, Ser. No. 679,016
Int. Cl.[3] C12Q *1/24;* C12M *1/26, 1/32*
U.S. Cl. 435—30 **40 Claims**



1. Apparatus for streaking media with a specimen comprising a magazine for selectively storing plates containing various agar media having lids thereon and movable to present a selected plate to a delivery position, means for delivering a selected plate to a first position, means for removing the lid at said first position, means for streaking a specimen on the media in said plate, means for moving said plate after streaking to another position and replacing the lid thereon, and means for moving said plate from said lid replacing position to a pick-up position, said means for delivering comprising a pushing mechanism arranged to push a plate from a selected stack in said magazine from said delivery position to said first position, and further means for transferring the plate to a second position for streaking prior to transfer to said another position.

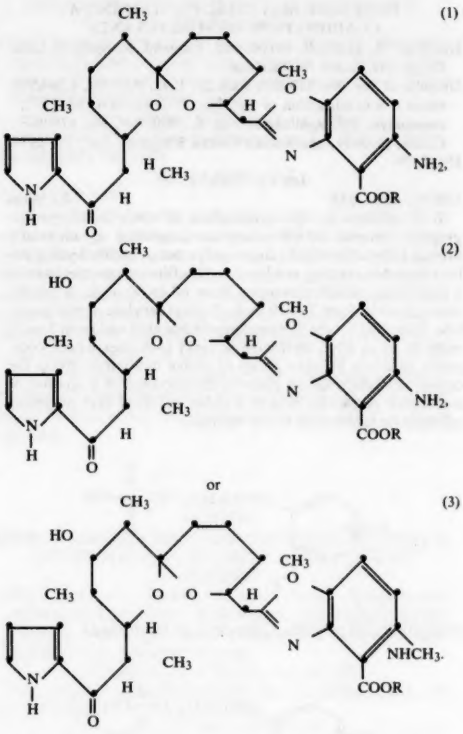
4,287,302

MICROBIOLOGICAL MODIFICATION OF ANTIBIOTIC A23187 ESTERS

Bernard J. Abbott, Greenwood, and David S. Fukuda, Brownsburg, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 971,616, Dec. 30, 1978, Pat. No. 4,247,703. This application Jul. 30, 1980, Ser. No. 173,511
Int. Cl.[3] C12P *17/18;* C12R *1/52*
U.S. Cl. 435—119 **5 Claims**

1. A process for preparing a compound of the formula:



wherein R is methyl, ethyl, n-propyl, i-propyl, n-butyl, i-butyl, or t-butyl; which comprises cultivating *Streptomyces chartreusis* NRRL 11407 in a culture medium containing assimilable sources of carbon, nitrogen, and inorganic salts under submerged aerobic conditions; adding a (lower) alkyl ester of antibiotic A23187 to the culture medium; and incubating the culture medium until a substantial amount of the compound is produced.

4,287,303

PRODUCTION OF ETHANOL

Bengt I. Dahlberg, Uttran; Lars K. J. Ehnström, Tullinge, both of Sweden, and Carroll R. Keim, Stamford, Conn., assignors to Alfa-Laval AB, Tumba, Sweden

Filed Nov. 13, 1979, Ser. No. 93,068
Int. Cl.[3] C12P *7/14*
U.S. Cl. 435—162 **4 Claims**

1. In the method of producing ethanol from a carbohydrate-containing substrate mixed with non-fermentable solids, said method including the steps of continuously separating said substrate and solids into a flow rich in said solids and a substrate flow free from said solids, passing said substrate flow to a fermenter to produce ethanol by fermentation of said carbohydrate in the presence of yeast, withdrawing continuously from the fermenter a discharge stream of fermentation liquor containing yeast and ethanol, centrifugally separating said discharge stream continuously into at least a yeast concentrate flow and a yeast-free ethanol-containing flow, recirculating said yeast concentrate flow to the fermenter, and continuously separating said yeast-free flow into an ethanol-enriched flow and a residual flow, the improvement which comprises contacting at least part of said residual flow with said flow rich in

solids to form a mixture, continuously separating said mixture in a plurality of separators into solids from which remaining substrate has been substantially removed and a flow enriched in substrate, and returning said flow enriched in substrate to the fermenter.

4,287,304

FERMENTABLE SUGAR FROM THE HYDROLYSIS OF STARCH DERIVED FROM DRY MILLED CORN

Werner C. Muller, Dobbs Ferry, N.Y., and Franklyn D. Miller, Cincinnati, Ohio, assignors to National Distillers and Chemical Corp., New York, N.Y.

Filed Jan. 14, 1980, Ser. No. 112,033
Int. Cl.³ C12P *7/14*
U.S. Cl. 435—162 **13 Claims**

1. A process for converting the starch fraction derived from whole dry milled corn to a sterile aqueous solution of fermentable sugar, said starch containing water insoluble protein and oil and one or more water soluble components selected from the group consisting of sugar, lipid, protein, vitamin and mineral, which comprises:

(a) liquefying an aqueous slurry of the starch by hydrolysis to provide sterile aqueous partial starch hydrolysate slurry containing the water insoluble protein and oil and the water soluble components in substantially unaltered condition;

(b) separating the slurry resulting from liquefying step (a) into an aqueous sterile slurry of partial starch hydrolysate containing a part of the water soluble components and an aqueous slurry of water insoluble protein and oil containing the remaining part of the water soluble components; and,

(c) saccharifying the relatively thin aqueous slurry of partial starch hydrolysate to provide a sterile aqueous solution of fermentable sugar.

4,287,305

MICROORGANISM IMMOBILIZATION

Alicia L. Compere, Knoxville, and William L. Griffith, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 30, 1976, Ser. No. 701,479
Int. Cl.³ C13N *11/14*; C12N *11/08*
U.S. Cl. 435—176 **4 Claims**

1. A process for producing an aggregate support material coated with a crosslinked coating, said coating having live, metabolically active microorganisms attached thereto, comprising the steps of:

contacting a particle of aggregate material with a water dispersible gelatin;

crosslinking said gelatin by reacting it with a glutaraldehyde to provide a crosslinked coating on said particle of aggregate material;

then contacting said coated particle with live microorganisms; and

then incubating said microorganisms in contact with said crosslinked coating to provide a coating having metabolically active microorganisms attached thereto, said microorganisms having continued growth and reproductive functions.

4,287,306

APPARATUS FOR GENERATION OF ANAEROBIC ATMOSPHERE

John H. Brewer, Abilene, Tex., assignor to Becton, Dickinson and Company, Paramus, N.J.

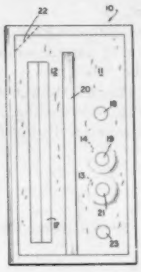
Filed Apr. 2, 1979, Ser. No. 26,337
Int. Cl.³ B01J *7/00, 8/02*; C12M *1/00*
U.S. Cl. 435—287 **10 Claims**

1. A unitary package for generating an anaerobic atmosphere for use in culturing anaerobic microorganisms, characterized by

(a) a flexible sealed package;

(b) material in said package for generating hydrogen;

(c) material in said package for generating carbon dioxide; and



(d) a catalyst coated onto the exterior surface of said flexible sealed package;

(e) whereby when said package is broken and water is inserted to react with said hydrogen generating material said externally coated catalyst catalyzes the reaction between oxygen outside said package and the said generated hydrogen.

4,287,307

INTEGRAL SKIN MICROCELLULAR POLYESTER BASE POLYURETHANE ELASTOMERS

Fritz Hostettler, Freehold, N.J., assignor to Plastics Technology Associates, Inc., Farmingdale, N.J.

Filed Mar. 5, 1980, Ser. No. 127,791
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—51 **27 Claims**

1. In a process of preparing an integral-skin microcellular polyester base polyurethane elastomer, the improvement comprising reacting a hydroxyl-terminated aliphatic polyester, an isocyanate and/or an isocyanate prepolymer of an aliphatic or an aromatic glycol and/or triol, in the presence of a blowing agent and at least one plasticizer of the following formulae:

a.
$$R-(OCH_2CH\frac{R'}{}_{\overline{Y}}OC-Z-CO+CHCH_2O)_x-R$$

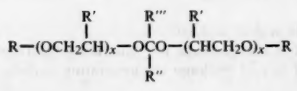
or mixtures thereof,

wherein R may be different for each position and is alkyl of from 1 to 12 carbon atoms, aryl, alkylated aralkyl, wherein the alkyl moieties may be up to 4 carbon atoms, R' may be different in each of the repeating units, and is H or alkyl up to 4 carbon atoms; Z is alkylene of 2 to 10 carbon atoms; arylene and substituted arylene, aralkylene, wherein the alkylene portion thereof is up to 4 carbon atoms; cycloalkylene of 5 to 8 carbon atoms; and x stands for an integer from 1 to 5;

b.
$$RCO-(CH_2CHO)_x-CR$$

or mixtures thereof,

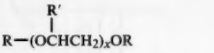
wherein R may be different for each position and is alkyl from 1 to 12 carbon atoms; aryl; substituted aryl; aralkyl; alkaryl wherein the "alk" or alkyl portion of each is up to 4 carbon atoms; or cycloalkyl of 5 to 8 carbon atoms in the ring; and R may be different in each repeating unit and is hydrogen or alkyl from 1 to 4 carbon atoms; and x stands for an integer from 2 to 10;



c.

or mixtures thereof,

wherein R may be different for each of the positions and is alkyl of from 1 to 12 carbon atoms; aryl; substituted aryl; alkaryl wherein the "alk" moiety is up to 4 carbon atoms; cycloalkyl of 5 to 8 carbon atoms in the ring; R′ is H, or alkyl from 1 to 4 carbon atoms in the ring; R″ and R‴ are H, or alkyl from 1 to 4 carbon atoms; and x stands for an integer from 1 to 5; or



d.

or mixtures thereof,

wherein R may be different for each position and is alkyl from 1 to 12 carbon atoms; arly; substituted aryl; aralkyl or alkaryl wherein the "alk" or alkyl portion of each is up to 4 carbon atoms; cycloalkyl of 5 to 8 carbon atoms in the ring; and R′ is H or alkyl or substituted alkyl of up to 4 carbon atoms; and x stands for an integer from 1 to 10.

4,287,308

PROCESS FOR PREPARING A THERMO-EXPANDABLE MICROSPHERES

Nobukazu Nakayama, and Sueo Kida, both of Nara, Japan, assignors to Matsumoto Yushi-Seiyaku Co., Ltd., Osaka, Japan

Filed Jun. 10, 1980, Ser. No. 158,172
Claims priority, application Japan, Feb. 14, 1980, 55/17372
Int. Cl.³ C08J *9/36*
U.S. Cl. 521—53 **5 Claims**

1. A process for preparing a thermo-expandable microsphere substantially free of acrylonitrile monomer which comprises microencapsulating a blowing agent with a thermoplastic polymer having an acrylonitrile moiety as one of ingredients, wherein the blowing agent becomes gaseous below a softening temperature of the thermoplastic polymer, and subjecting the microencapsulated product to cyanoethylation to eliminate the acrylonitrile monomer remaining in the microencapsulated product.

4,287,309

POLYURETHANE FOAMS CONTAINING BROMINATED DIPHENYL ETHER

David S. Cobbledick, Kent, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Jul. 2, 1980, Ser. No. 165,315
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—114 **10 Claims**

1. In the method of making a flexible or semiflexible low density polyetherurethane foam using the one-shot or prepolymer process by the reaction of (A) a polyetherpolyol having from two to four hydroxyl groups and having a molecular weight of from about 1,000 to 10,000, (B) an organic polyisocyanate and (C) a blowing agent comprising water in admixture with (D) a surfactant, (E) a catalyst, (F) finely divided zinc oxide in an amount of from about 0.1 to 10 parts by weight per 100 parts by weight of said polyol, and (G) finely divided antimony trioxide in an amount of from about 0.5 to 15 parts by weight per 100 parts by weight of said polyol, the improvement comprising incorporating in the formulation prior to foaming a brominated diphenyl ether having from 4 to 10 bromine atoms in an amount of from about 5 to 25 parts by weight per 100 parts by weight of said polyol.

4,287,310

THERMOSETTING POWDER BASED ON AN UNSATURATED POLYESTER RESIN

Rene L. E. van Gasse, Opglabbeek, Belgium, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Apr. 24, 1980, Ser. No. 144,647
Claims priority, application Netherlands, May 2, 1979, 7903429
Int. Cl.³ C08L *67/00*
U.S. Cl. 525—44 **5 Claims**

1. A thermosetting powder based on an unsaturated polyester resin having a softening temperature of at least 50° C. wherein said powder comprises a homogeneous mixture containing 50 to 92% by weight of unsaturated polyester resin, 5 to 30% by weight of a prepolymer of a diallylester of an aromatic dicarboxylic acid, 3 to 20% by weight of high-boiling, crosslinking monomer having a boiling point greater than 200° C. and a vapor pressure less than 10 mm mercury at 150° C., and 0.1 to 5% by weight of hardening catalyst, these weight percentages relating to the overall quantity of the abovementioned polymerizable components.

4,287,311

GLUE FOR WOOD LAMINATING COMPRISING THERMOSETTING CONDENSATION RESIN AND MODIFIED PVA

Yasuo Taniguchi; Toshiharu Ike, and Hideo Nakaya, all of Ohmi, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1979, Ser. No. 90,026
Claims priority, application Japan, Oct. 31, 1978, 53-133240
Int. Cl.³ C08L *61/32*
U.S. Cl. 525—58 **5 Claims**

1. A glue for wood laminating which comprises a thermosetting condensation resin and a modified polyvinyl alcohol having a hydrophobic group in the side chain thereof, said modified polyvinyl alcohol being present in an amount 0.2 to 5% by weight based on the thermosetting glue and being produced by copolymerizing vinyl acetate and a monomer having a hydrophobic alkyl group in the side chain thereof and subsequently saponifying the vinyl acetate moiety of the resultant copolymer to a degree of not less than 75 mol percent or by esterifying or etherifying hydroxyl groups of a polyvinyl alcohol, said monomer used for said copolymerization being at least one member selected from the group consisting of vinyl esters of aliphatic acids and alkyl vinyl ethers.

4,287,312

PROCESS FOR PRODUCING A GRAFT-COPOLYMER AND BLENDS THEREWITH

Haruhiko Yusa; Masanori Oota, and Katumi Suzuki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Apr. 10, 1979, Ser. No. 28,798
Claims priority, application Japan, Apr. 13, 1978, 53/43694
Int. Cl.³ C08L *51/04*
U.S. Cl. 525—83 **9 Claims**

1. A process for preparing a thermoplastic resin composition having an improved impact resistance which comprises blending 100 parts by weight of a thermoplastic resin selected from the group consisting of vinyl chloride resins, styrene-methyl methcrylate copolymer resins and styrene-acrylonitrile resins and 1 to 50 parts by weight of a graft-copolymer obtained by a process which comprises adding an aqueous solution of a salt of a strong acid and a monovalent strong base, which solution has been adjusted to a pH value of 8 to 13, to a rubber latex containing diene rubber particles, said latex having a pH of 8.0–10.0 and said diene rubber therein comprising at least 50% butadiene, and a fatty acid soap as an emulsifying agent to coagulate the rubber particles and thereafter adding a vinyl monomer selected from the group consisting of alkyl methacrylates, aromatic vinyl monomers, acrylonitrile, and alkyl

acrylates to the latex containing the coagulated rubber particles to graft-polymerize the vinyl monomer.

4,287,313

BLOCK COPOLYMERS OF CONJUGATED DIENES AND LACTONES AS MODIFIERS OF UNSATURATED POLYESTERS

Raymond F. Uber; Clifford W. Childers, and Floyd E. Naylor, all of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartlesville, Okla.

Filed Apr. 4, 1979, Ser. No. 27,123

Int. Cl.³ C08L *9/00, 9/06, 67/04, 67/06*

U.S. Cl. 525—91 **29 Claims**

1. A composition comprising:

(a) a block copolymer of the form $A\text{-}D)_y$ wherein A is a polymer segment which comprises one or more polymer blocks formed at least in part from one or more conjugated diene monomers, D is a polymer segment which comprises one or more polymer blocks formed from one or more lactone monomers, and y is 1, 2, 3 or 4;

(b) an unsaturated polyester; and

(c) a vinyl monomer.

4,287,314

MALEIMIDE-STYRENE COPOLYMER BLEND WITH POLYURETHANE

Ronald A. Fava, Monroeville, Pa., assignor to Arco Polymers, Inc., Philadelphia, Pa.

Filed Sep. 5, 1980, Ser. No. 184,502

Int. Cl.³ C08L *75/04, 75/06*

U.S. Cl. 525—130 **3 Claims**

1. A thermoplastic composition for molding of plastic articles consisting of a blend of

A. polyurethane

B. a resin containing 5 to 35% maleimide and 65 to 95% styrene each of components A and B being present in a weight concentration within a range from 40% to 60%.

4,287,315

POLYAMIDE BLENDS

Rolf-Volker Meyer; Rolf Dhein, and Friedrich Fahnler, all of Krefeld, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 56,247, Jul. 10, 1978, abandoned, which is a continuation of Ser. No. 942,628, Sep. 15, 1978, abandoned. This application Aug. 23, 1979, Ser. No. 68,938

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1977, 2742177

Int. Cl.³ C08L *77/00*

U.S. Cl. 525—183 **9 Claims**

1. Polymer blends with improved impact strength consisting of:

(I) from 70 to 99% by weight of at least one polyamide and

(II) from 1 to 30% by weight of a high molecular weight olefinic copolymer having a melting point of at least 100° C. and a melt index of from 1–20 g/10 min. at 190° C. measured according to DIN 53 735 consisting of:

(a) from 65 to 98% by weight of at least one α-olefine,

(b) from 1 to 15% by weight of at least one amide of an α-β-unsaturated carboxylic acid and

(c) from 1 to 20% by weight of at least one alkyl or alkenyl ester of an α,β-unsaturated carboxylic acid, the sum of (I) and (II) and the sum of (a)–(c) being in each case always 100% by weight.

4,287,316

TRANSPARENT RESIN COMPOSITION FOR INFORMATION SIGNAL RECORDING DISCS

Akira Kaneko, Tokyo; Masaki Ohya, Iwaki; Masayasu Suzuki, Iwaki, and Akio Kobayashi, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1979, Ser. No. 32,928

Claims priority, application Japan, Apr. 24, 1978, 53-47876

Int. Cl.³ C08L *9/02, 33/08*

U.S. Cl. 525—296 **8 Claims**

1. In a transparent resin composition for information signal recording discs each having information pits engraved on one side thereof and a metal coating deposited thereon, information signals recorded on the information pits being reproducible by irradiation with laser rays from the opposite side of said disc, the improvement wherein the resin composition comprises (1) 6 to 100% by weight of a nitrile graft copolymer having a rubber trunk polymer and a branch polymer grafted thereon, which has been obtained by graft-polymerizing onto the rubber trunk polymer a monomer mixture consisting of an unsaturated nitrile and at least one monomer copolymerizable therewith selected from the group consisting of alkyl acrylates, alkyl methacrylates, acrylic acid, methacrylic acid, acryl amides, and alkyl vinyl ethers, and (2) 0 to 94% by weight of a nitrile randon compolymer of an unsaturated nitrile and at least one monomer copolymerizable therewith selected from the group consisting of alkyl acrylates, alkyl methacrylates, acrylic acid, methacrylic acid, acryl amides, vinyl esters and alkyl, the components of the resin composition other than the rubber trunk polymer constituting a matrix resin, wherein:

(a) said rubber trunk polymer has a glass transition temperature of not higher than 0° C. and constitutes 4 to 25% by weight of the resin composition;

(b) the unsaturated nitrile constitutes 25 to 90% by weight of the matrix resin in the resin composition;

(c) the difference in the refractive indexes between the rubber trunk polymer and the matrix resin is not more than 0.008; and

(d) the resin composition, when molded into a 3 mm-thick plate, has a transmittance in diethyl phthalate of not lower than 95% with respect to the laser rays used.

4,287,317

CONTINUOUS PROCESS FOR PRODUCING RUBBER-MODIFIED METHYL METHACRYLATE SYRUPS

Yoshihiko Kitagawa, Toyonaka; Yoshimi Hanamura, Niihama; Masahiro Yuyama, Niihama; Masahiko Moritani, Niihama; Akira Sakuramoto, Niihama, and Mikio Suzuki, Niihama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 22, 1980, Ser. No. 142,638

Claims priority, application Japan, Apr. 27, 1979, 54-52972

Int. Cl.³ C08F *255/06, 263/04, 265/06, 279/02*

U.S. Cl. 525—309 **10 Claims**

1. A continuous process for producing a rubber-modified methyl methacrylate syrup, which comprises continuously supplying a material liquor comprising 1 to 20 parts by weight of a rubbery polymer dissolved in 100 parts by weight of a monomer comprising 60 to 100% by weight of methyl methacrylate and 0 to 40% by weight of an ethylenically unsaturated monomer copolymerizable with methyl methacrylate, and a radical-polymerization initiator having a half life period of 5 seconds or less at 180° C. or lower to the first reaction zone wherein the starting materials are substantially completely mixed, continuously polymerizing at such a stationary conversion that the rubbery polymer is dispersed in the form of particles, while maintaining the temperature and residence time in the range of 0.5 to 30 minutes in the zone so that a steady-state is achieved in the zone and the steady-state concentration of the initiator in the reaction mixture is ½ to 1/1,000 time as much as the concentration of initiator supplied, continuously taking out the resulting reaction mixture from the zone, and passing it

through the second reaction zone having a volume of 0 to 5 times as much as that of the first reaction zone wherein a piston flow is substantially achieved, and thereby the final concentration of the initiator being decreased to obtain a stable syrup comprising a disperse phase and a continuous phase, the former phase being a solution of a major amount of the rubbery polymer and a minor amount of the resinous polymer in the monomer, the latter one being a solution of a major amount of the resinous polymer and a minor amount of the rubbery polymer in the monomer, the average particle diameter of the disperse phase of the syrup being in the range of 0.1 to 20μ and the number average polymerization degree of resinous polymers in the continuous phase of the syrup being within a range of 300 to 6,000, and the conversion of monomer to polymer of 5 to 40% being achieved.

4,287,318

PROCESS FOR PREPARING RUBBER REINFORCED STYRENIC RESINS

William J. I. Bracke, Hamme, and Emmanuel Lanza, Brussels, both of Belgium, assignors to Labofina S.A., Brussels, Belgium

Filed Mar. 27, 1980, Ser. No. 134,474
Int. Cl.³ C08F *291/12, 265/08, 267/08*
U.S. Cl. 525—313 **17 Claims**

1. A process for the continuous production of ABS-type resins which are copolymers of a styrenic compound, acrylonitrile and conjugated diolefinic hydrocarbon compound, which comprises the steps of;

(a) charging continuously a diolefinic compound and a solution of a copolymeric matrix of styrenic compound and acrylonitrile in an inert saturated hydrocarbon solvent having a boiling point ranging between 120° and 175° C., into a polymerization zone comprising at least a first and second reactor,

(b) subjecting the mixture thus formed to mass polymerization in said first reactor at a temperature less than about 100° C.,

(c) thereafter continuously changing subjecting said mixture to mass polymerization in said second reactor at a temperature ranging from about 100° to about 140° C. in the presence of from about 0.02 to about 2.5 weight percent of free radical generating catalyst, based on the total weight of copolymeric matrix and diolefinic compound, whereby there is formed in situ during said mass polymerization in said first and second reactors a rubbery material dispersed in said copolymer matrix,

(d) withdrawing continuously the reaction mixture from said polymerization zone and subjecting it to a heat treatment to remove the residual diolefinic compound and the solvent, and

(e) recovering the ABS resin.

4,287,319

COMPOSITIONS OF POLYVINYLPYRIDINE AND IODINE

Gary M. Phillips, St. Paul, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 6,003, Jan. 24, 1979, abandoned. This application Jan. 23, 1980, Ser. No. 114,730
Int. Cl.³ C08F *8/22*
U.S. Cl. 525—336 **3 Claims**

1. A composition comprising an initial polyvinylpyridine polymer component, selected from the group consisting of P2VP, P4VP and mixtures thereof, and iodine in a predetermined mole ratio of from about 20:1 to about 40:1, the composition having a conductivity measured at 37° C. of at least about 1.5×10^{-3} reciprocal ohm-cm and being formed in a sealed container by mixing the polymer component and at least a portion of the iodine together and by heating the polymer component before or during mixing, or by heating the resultant mixture, to a temperature in excess of about 225° C., and thereafter adding the remaining balance, if any, of the iodine to make-up the predetermined mole ratio.

4,287,320

COMPOSITION OF FLUOROELASTOMER AND DIORGANOSULFUROXIDE

Robert E. Kolb, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 493,537, Aug. 1, 1974, abandoned, which is a continuation of Ser. No. 406,832, Oct. 16, 1973, abandoned. This application Feb. 19, 1980, Ser. No. 122,513
Int. Cl.³ C08F *8/34, 8/00*
U.S. Cl. 525—340 **15 Claims**

1. A curable fluoroelastomer composition consisting essentially of elastomeric co-polymer of vinylidene fluoride and terminally ethylenically unsaturated fluorinated comonomer, and for each hundred parts of said co-polymer:

a. 0.2 to 5 parts diorganosulfur oxide, which contains two like or unlike aliphatic, cycloaliphatic or aromatic groups which are unsubstituted or substituted only with halogen;

b. 0.1 to 5 parts quaternary phosphonium or ammonium compound;

c. a total of 3 to 40 parts consisting of 0 to 25 parts acid acceptor, and 0 to 25 parts optional base; and

d. 0.2 to 5 parts aromatic hydroxy or amino compound.

4,287,321

POLY(PHENYLENE ETHER)POLY(VINYL AROMATIC) COMPOSITIONS

Walter K. Olander, Mount Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 10, 1979, Ser. No. 102,280
Int. Cl.³ C08G *65/40, 65/44*
U.S. Cl. 525—392 **12 Claims**

1. A process for the preparation of a composition comprising a polyphenylene ether and a poly(vinyl aromatic) compound, said process comprising the steps of:

(a) oxidatively coupling a phenolic monomer to form a polyphenylene ether in a basic reaction medium comprising a polymerizable vinyl aromatic compound in the presence of a manganese chelate complex of the formula

$$(L)_xMn$$

wherein L is a ligand derived from an ω-hydroxyoxime by conventional means, Mn is the transition metal manganese and x is at least equal to about 0.05;

(b) selectively liquid-liquid extracting from the reaction mixture of step (a) with an immiscible solvent to the base-reactive by-products therein; and

(c) thereafter heating the base-extracted solution of polyphenylene ether in vinyl aromatic compound under polymerization conditions until at least part of said vinyl aromatic compound has been polymerized.

4,287,322

EPICHLOROHYDRIN ELASTOMER COMPOSITIONS

Allan T. Worm, North St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 23, 1979, Ser. No. 87,503
Int. Cl.³ C08G *65/32*
U.S. Cl. 525—403 **26 Claims**

1. A polyepichlorohydrin gum stock composition, comprising:

(a) polyepichlorohydrin gum;

(b) polyphenol curing agent;

(c) organo-onium cocuring agent selected from compounds of the formulas

$$(R^1)_4Q^{+1}(X^{-m})_{1/m}$$

$$(R^1)_3QR^2Q(R^1)_3{}^{+2}(X^{-m})_{2/m}$$

wherein Q is a nitrogen, arsenic or phosphorus atom; X is an anion of valence m; each R^1 is a monovalent organic radical containing 1 to 20 carbon atoms, is the same as or different from any other R^1, and can combine with another R^1 to form a cyclic structure containing a Q atom; and R^2 is a divalent organic radical containing 2 to 12 carbon atoms;

$$(R^3)_3S^{+1}(X^{-m})_{1/m}$$

or

$$(R^3)_2SR^4S(R^3)_2{}^{+2}(X^{-m})_{2/m}$$

wherein S is sulfur; X is an anion of valence m; each R^3 is a monovalent organic radical containing 1 to 20 carbon atoms, is the same as or different from any other R^3, and can combine with another R^3 to form a cyclic structure containing an S atom; R^4 is a divalent organic radical containing 2 to 12 carbon atoms; and at least one R^3 or R^4 group is aromatic;

which composition in reactive association with an acid acceptor will, upon exposure to heat, cure into an elastomer.

4,287,323

ADDITION POLYMERIZABLE POLYETHERS HAVING PENDANT ETHYLENICALLY UNSATURATED URETHANE GROUPS

Nancy B. Tefertiller; Kenneth A. Burdett, and Robert F. Harris, all of Midland, Mich., assignors to The Dow Chemical Co., Midland, Mich.

Continuation-in-part of Ser. No. 961,000, Nov. 15, 1978, Pat. No. 4,233,425. This application Jan. 5, 1979, Ser. No. 1,125

The portion of the term of this patent subsequent to Nov. 11, 1997, has been disclaimed.

Int. Cl.³ C08L *75/08*

U.S. Cl. 525—404 **12 Claims**

4. An addition polymerizable composition comprising an addition polymerizable polyether which is represented by the formula:

$$Y[(R'''A\tilde{\gamma}_m R'''-Z]_x$$

wherein each A is individually —O—, —S—,

wherein R_1 is hydrogen or alkyl; Y is hydroxyl, an oxycarbonylamino ester of an α,β-ethylenically unsaturated carboxylic acid or a residue of an active hydrogen initiator suitably employed in preparation of a polyether; each Z is individually hydroxyl, oxyhydrocarbyl, oxycarbonylhydrocarbyl or said oxycarbonylamino ester group provided that the polyether contains at least one of said oxycarboxylamino ester groups, each R''' is individually alkylene or haloalkylene wherein alkylene has at least two carbons; m is a whole number such that $—R'''A)_m—R'''—$ has a number average molecular weight from about 100 to about 100,000, and x is a whole number from 1 to 8 and a copolymerizable monomer(s), said monomer(s) is monoethylenically or polyethylenically unsaturated monomers which undergo addition polymerization upon exposure to actinic radiation and/or chemical initiation.

4,287,324

COMPOSITIONS OF EPICHLOROHYDRIN RUBBER AND POLYESTER

Aubert Y. Coran, and Raman Patel, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed May 12, 1980, Ser. No. 149,076

Int. Cl.³ C08L *63/00*

U.S. Cl. 525—408 **22 Claims**

1. A composition comprising a blend of about 5–75 parts by weight of crystalline polyester, and, correspondingly, about 95–25 parts by weight of cured epichlorohydrin rubber.

4,287,325

COPOLYESTERS DERIVED FROM AROMATIC POLYESTERS AND GLYCOL POLYESTERS

Winston J. Jackson, Jr., and Herbert F. Kuhfuss, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 26, 1979, Ser. No. 106,962

Int. Cl.³ C08L *67/02*

U.S. Cl. 525—444 **3 Claims**

1. Copolyesters prepared from 50 to 80 weight percent of an aromatic polyester derived from 20–80 mole percent terephthalic acid, 80–20 mole percent isophthalic acid and 4,4'-isopropylidenediphenol; and 50–20 weight percent of a glycol polyester derived from terephthalic acid, 50–80 mole percent ethylene glycol, and 50–20 mole percent 1,4-cyclohexanedimethanol.

4,287,326

SILOXANE-MODIFIED EPOXY RESIN COMPOSITIONS

Ryuzo Mikami, Ichihara, Japan, assignor to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Mar. 3, 1980, Ser. No. 126,231

Int. Cl.³ C08L *63/02, 83/06*

U.S. Cl. 525—476 **10 Claims**

1. A siloxane-modified epoxy resin composition consisting essentially of (A) 100 parts by weight of a siloxane-modified epoxy resin prepared by reacting (1) 5 to 70 parts by weight of an alkylphenylpolysiloxane of the general unit formula

$$R_aSiX_bO(4-a-b/2)$$

wherein each R is an alkyl or phenyl radical such that the ratio of alkyl radicals to phenyl radicals in the alkylphenylpolysiloxane is 0.3 to 3.0, X is an alkoxy radical or a hydroxyl radical, a is 0.9 to 1.8, and b is 0.01 to 2 with (2) 95 to 30 parts by weight of an epoxy resin having at least two epoxy groups per molecule, (B) 0.01 to 100 parts by weight of an organosilicon compound having attached to silicon an alkoxy radical and a monovalent organic radical containing a functional group selected from the group consisting of an epoxy group, a methacryl group and an amino group and (C) a curing agent for (A).

4,287,327

PROCESS FOR CONTROLLING POLYMER PARTICLE SIZE IN VAPOR PHASE POLYMERIZATION

Glenn O. Michaels, and Michael J. Spangler, both of South Holland, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 29, 1980, Ser. No. 191,854

Int. Cl.³ C08F *2/34*

U.S. Cl. 526—86 **7 Claims**

1. In a process for the continuous vapor phase polymerization of at least one olefin utilizing a polymerization catalyst which is charged to an existing bed of polymer particles the improvement comprising contacting said catalyst with a stream of wetting liquid before said catalyst is dispersed in said bed, said wetting liquid being introduced at a wetting liquid flux density greater than about 20.

4,287,328

METHOD FOR PRODUCING α-OLEFIN POLYMERS

Kazutsune Kikuta; Masami Tachibana, both of Ichiharashi, and Akihiro Sato, Chibaken, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Mar. 21, 1979, Ser. No. 22,613
Claims priority, application Japan, Dec. 1, 1978, 53-148728
Int. Cl.³ C08F *4/02, 10/06*
U.S. Cl. 526—115 **16 Claims**

1. In the method for producing α-olefin polymers by polymerizing α-olefins in the presence of a catalyst, said catalyst being obtained by:

(a) reacting one mol of anhydrous $AlCl_3$ or anhydrous $FeCl_3$ with 0.1 to 20 mols of a compound selected from the group consisting of $Mg(OH)_2$, MgO, $Mg_6Al_2(OH)_{16}CO_3.4H_2O$, $MgCO_3$, $MgAl_2O_4$ or $3MgCO_3.Mg(OH)_2.H_2O$; the reaction being carried out by milling and heating at a temperature between room temperature and 500° C., to thereby produce a solid product (I);

(b) reacting 1–5,000 g of at least one electron donor with 100 g of said solid product (I) in from one to ten steps in a suspension reaction manner or a milling reaction manner and at a temperature of between 0° C. and 500° C.,

(c) reacting 1–5,000 g of at least one electron acceptor with 100 g of said solid product (I) in from one to ten steps, using $TiCl_4$ as an electron acceptor in at least one step, in a suspension reaction manner or a milling reaction manner, and at a temperature of between 0° C. and 500° C.,

these two kinds of reactions (b) and (c) being carried out separately or simultaneously together to thereby form a solid product (II),

(d) forming catalyst components by combining said solid product (II) with an organoaluminum compound and an electron donor,

said electron donors being selected from the group consisting of compounds having the general formula RCOOR′, ROH, ROR′, RCOR′, and polysiloxanes characterized by the formula

(wherein n=3 to 10,000 and R_1 and R_2 represent hydrogen or methyl and may be the same or different) and wherein in all of the foregoing formulas R and R′ are alkyl or aryl groups having 1 to 20 carbon atoms,

said electron acceptors being selected from the groups consisting of anhydrous $SiCl_4$, $SnCl_2$, $SnCl_4$ and $TiCl_4$, the improvement which comprises

(1) carrying out a catalyst activation step by either

(A) contacting an α-olefin with said solid product (II) and an organoaluminum compound at a temperature of 20°–100° C. under polymerizing conditions so as to thereby effect a preliminary polymerization, and then adding to this preliminary polymerization product one of the electron donors set forth above so that the total amounts of said organoaluminum compound, said electron donor and said α-olefin are 0.05 to 500 g, 0.05 to 20 g and 0.05 to 1,000 g respectively based on one gram of said solid product (II), or

(B) contacting an α-olefin with said solid product (II), an organoaluminum compound and one of said electron donors at a temperature of 20°–100° C. under polymerizing conditions so as to thereby effect a preliminary polymerization and then adding to this preliminary polymerization product one of the electron donors set forth above so that the total amounts of said organoaluminum compound, said electron donor and said α-olefin are 0.05 to 500 g, 0.05 to 20 g and 0.05 to 1,000 g respectively based on one gram of said solid product (II), and

(2) polymerizing α-olefins in the presence of the catalysts activated in accordance with step (1).

4,287,329

EMULSION PROCESS FOR PREPARING ELASTOMERIC VINYL ACETATE-ETHYLENE COPOLYMER AND HIGH MOONEY VISCOSITY LOW GEL CONTENT ELASTOMER OBTAINED THEREFROM

Manfred Heimberg, Cincinnati, Ohio, assignor to National Distillers and Chemical Corp., New York, N.Y.

Continuation-in-part of Ser. No. 5,069, Jan. 22, 1979, abandoned. This application Mar. 24, 1980, Ser. No. 132,946
Int. Cl.³ C08F *2/30, 218/08*
U.S. Cl. 526—202 **13 Claims**

1. In a process for preparing elastomeric vinyl acetate-ethylene copolymers having a Mooney viscosity value greater than about 30 and low gel content wherein vinyl acetate monomer is copolymerized with ethylene monomer in an aqueous emulsion reaction medium containing surface active agent, polymerization catalyst and protective colloid to provide a latex and vinyl acetate-ethylene elastomer is recovered from the latex, the improvement which comprises copolymerizing from about 40% to about 70% by weight of vinyl acetate monomer with from about 60% to about 30% by weight of ethylene monomer in an aqueous emulsion reaction medium to provide a latex, the reaction medium for vinyl acetate-ethylene elastomer containing:

(i) at least one surface active agent having a hydrophilic lipophilic balance value of at least 22 in an amount above about 2.0% by weight of the total monomer,

(ii) a polymerization catalyst, and

(iii) at least one protective colloid in an amount of less than about one part for each part by weight of total surface active agent, with the total weight of the surface active agent and vinyl acetate being present in the reaction medium at the commencement of copolymerization.

4,287,330

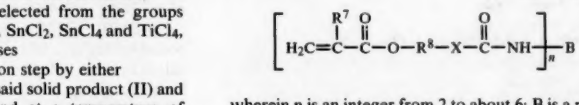
ACCELERATOR FOR CURABLE COMPOSITIONS

Richard D. Rich, Avon, Conn., assignor to Loctite Corporation, Newington, Conn.

Filed May 23, 1975, Ser. No. 580,267
Int. Cl.³ C08F *24/00, 18/20, 26/02*
U.S. Cl. 526—270 **3 Claims**

1. A curable adhesive and sealant composition comprising:

(a) a room temperature polymerizable acrylate ester having the formula

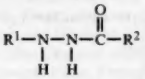


wherein n is an integer from 2 to about 6; B is a polyvalent organic radical selected from the group consisting of alkyl, alkenyl, cycloalkyl, cycloalkenyl, aryl, aralkyl, alkaryl and heterocyclic radicals both substituted and unsubstituted; R^7 is selected from the class consisting of hydrogen, chlorine and methyl and ethyl radicals; and R^8 is a divalent organic radical selected from the group consisting of lower alkylene of 1 through 8 carbon atoms, phenylene and napthylene, and X is selected from the group consisting of —O— and

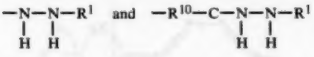
wherein R^9 is selected from the group consisting of hydrogen and lower alkyl of 1 through 7 carbon atoms;

(b) a free radical initiator in an amount sufficient to initiate polymerization of said ester; and,

(c) as a polymerization accelerator, a compound having the formula



wherein R^1 is phenyl substituted with C_1–C_4 alkyl group and R^2 is selected from the group consisting of hydrogen, alkyl, cycloalkyl, alkenyl, cycloalkenyl, aryl, alkoxy, aryloxy, carbonyl, amino, and the following groups:



wherein R^{10} is selected from the group consisting of alkyl groups containing one to about 10 carbon atoms, alkenyl groups containing two to about 10 carbon atoms, and aryl groups containing up to about 10 carbon atoms, said accelerator being present in an amount sufficient to accelerate the polymerization at room temperature.

4,287,331

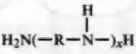
IMPROVED METHOD OF PREPARING HIGH MOLECULAR WEIGHT POLYAMINES

Kenneth G. Phillips, River Forest, and Paul J. Harris, Orland Park, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

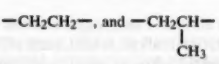
Filed Nov. 29, 1979, Ser. No. 98,454
Int. Cl.³ C08G *73/02*
U.S. Cl. 528—397 **11 Claims**

1. An improved process for making high molecular weight polyamines comprising:

reacting, in the presence of a self-limiting neutralizing agent, an alkylene dihalide selected from the group consisting of ethylene and 1,2-propylene dihalides with a nitrogen containing compound having the structural formula



where x is an integer of 0–5 and R is an alkylene radical selected from the group consisting of



to produce said polyamines and an acid by-product,

said self-limiting agent being present at the outset of the reaction in an amount sufficient to neutralize substantially all of said acid by-product expected from the reaction,

said self-limiting agent being a basic reagent with a sufficiently low aqueous solubility and K_b for neutralizing said acid by-product as it is produced while maintaining the pH of said reaction at a generally constant alkaline value.

4,287,332

PROCESS FOR IMPROVING THE CHEMICAL RESISTANCE OF AROMATIC POLYESTERS

Winston J. Jackson, Jr., and Herbert F. Kuhfuss, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 19, 1979, Ser. No. 95,278
Int. Cl.³ C08G *63/16*
U.S. Cl. 528—176 **4 Claims**

1. Process for improving the chemical resistance of shaped objects made from aromatic polyesters, the process comprising providing a shaped object formed from a copolyester derived from aromatic dicarboxylic acids, aromatic diols, optionally aromatic hydroxy acids, and at least 5 mole percent based on all repeating units of a substituted aromatic diol containing at least one substituent selected from the group of chlorine atoms, bromine atoms, alkyl groups containing one to three carbon atoms, alkoxy groups containing one to three carbon atoms and tolyl, and subjecting said shaped object to a temperature of at least 275° C. in an oxygen-containing atmosphere to raise the surface temperature of said shaped object to at least 275° C. and maintaining said surface temperature for a period sufficient to effect modification of said surface to improve its resistance to solvents.

4,287,333

PROCESS OF PREPARING FINELY DIVIDED THERMOPLASTIC RESINS

Dorothee M. McClain, Cincinnati, Ohio, assignor to National Distillers and Chemical Corp., New York, N.Y.

Continuation of Ser. No. 934,646, Aug. 17, 1978, Pat. No. 4,208,528. This application Aug. 27, 1979, Ser. No. 71,155
The portion of the term of this patent subsequent to Jun. 17, 1997, has been disclaimed.
Int. Cl.³ C08F *6/24*
U.S. Cl. 528—487 **11 Claims**

1. a process for preparing in finely divided form a solid organic polymeric thermoplastic resin consisting of:

(a) agitating a mixture of the resin while in the molten state, a dispersion-forming amount of water, and a dispersion-forming amount of an alkali metal salt of an organo-phosphate ester dispersing agent, to provide a hot aqueous dispersion of the resin; and,

(b) cooling the dispersion to below about 100° C. to provide solid particles of resin.

4,287,334

PROCESS FOR MANUFACTURING VISCOSE

Heinrich Fauth, Mainz, and Werner Koch, Hochheim-Massenheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 10, 1979, Ser. No. 101,448
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1978, 2855061
Int. Cl.³ C08B *9/04*
U.S. Cl. 536—60 **9 Claims**

1. A process for manufacturing viscose comprising:

(a) treating cellulose with an excess of alkali metal hydroxide solution in a first alkalization treatment, under conditions such that alkalized cellulose is produced; either

(b1) freeing the alkalized cellulose produced in step (a) from at least part of the excess hydroxide solution without pressing the alkalized cellulose, comprising the step of draining at least part of the excess alkali metal hydroxide solution from the reaction vessel in which step (a) is effected, and treating the drained alkalized cellulose with a second alkali metal hydroxide solution having a lower alkali metal hydroxide concentration than the alkali metal hydroxide solution used in step (a) in a second alkalization treatment while maintaining the temperature of the reaction mixture at not more than 18° C.; or

(b2) treating the alkalized cellulose produced in step (a) with an alkali metal hydroxide solution obtained by diluting the alkali metal hydroxide solution used in step (a) in a second alkalization treatment while keeping the temperature of the reaction mixture at not more than 18° C.;

(c) pressing the twice-alkalized cellulose from step (b1) or (b2) to remove excess hydroxide solution;

(d) shredding the pressed alkali cellulose from step (c);

(e) aging the disintegrated material from step (d) for a period of time to produce a product having a desired average degree of polymerization;

(f) sulfiding the shredded and aged alkali cellulose; and
(g) dissolving the sulfided product to produce a viscose solution.

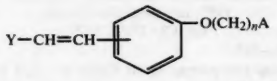
4,287,335

NITROGEN-CONTAINING HETEROCYCLIC COMPOUND HAVING ACETAL GROUP AND METHOD FOR MANUFACTURE THEREOF

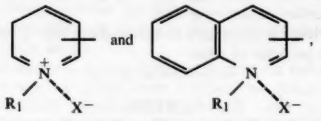
Kunihiro Ichimura, Yokohama, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Jun. 25, 1980, Ser. No. 162,834
Claims priority, application Japan, Jul. 4, 1979, 54-84817
Int. Cl.[3] **C07D** *213/30, 215/10, 405/10*
U.S. Cl. 542—455 **5 Claims**

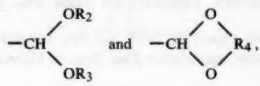
1. A nitrogen-containing heterocyclic compound represented by the formula:



wherein, Y is one member selected from the group consisting of



A is one member selected from the group consisting of



and n is an integer of 1 to 6, providing that in the formulas of Y and A, R_1 is one member selected from the group consisting of alkyl, aryl and aralkyl, R_2 and R_3 are each an alkyl group, R_4 is an alkylene group and X^- is a strongly acidic anionic residue.

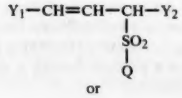
4,287,336

CHROMOGENIC PROPENYLENESULFONE COMPOUNDS

Jean C. Petitpierre, Kaiseraugst, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 10, 1979, Ser. No. 73,758
Claims priority, application Switzerland, Sep. 22, 1978, 9954/78
Int. Cl.[3] **C07C** *401/10, 403/10, 403/06*
U.S. Cl. 542—472 **16 Claims**

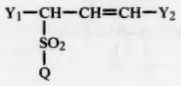
1. A chromogenic propenylenesulfone compound of the formula



(1A)

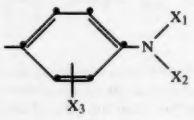
or

-continued



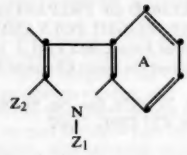
(1B)

wherein each of Y_1 and Y_2 independently represents an amino-substituted phenyl radical of the formula



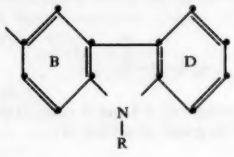
(1a)

a 3-indolyl radical of the formula



(1b)

or a 3-carbazolyl radical of the formula



(1c)

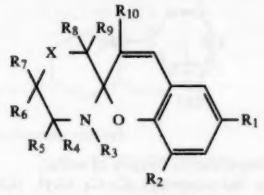
and Q represents alkyl of 1 to 12 carbon atoms or unsubstituted or substituted aryl or aralkyl, whilst each of X_1 and X_2 independently represents hydrogen, alkyl containing not more than 12 carbon atoms which is unsubstituted or substituted by halogen, hydroxyl, cyano or lower alkoxy, or represents cycloalkyl, phenyl, benzyl, or phenyl or benzyl which is substituted by halogen, lower alkyl or lower alkoxy, or X_1 and X_2 together with the nitrogen atom to which they are attached represent a pyrrolidino, piperidino, piperolino, morpholino, thiomorpholino or piperazino group, X_3 represents hydrogen, halogen, nitro, lower alkyl or lower alkoxy, each of R and Z_1 independently represents hydrogen, alkyl containing not more than 12 carbon atoms which is unsubstituted or substituted by halogen, hydroxyl, cyano or lower alkoxy, or represents alkenyl containing not more than 12 carbon atoms, acyl of 1 to 12 carbon atoms, phenyl, benzyl, or phenyl or benzyl which is substituted by halogen, lower alkyl, lower alkoxy or nitro, and Z_2 represents hydrogen, lower alkyl or phenyl, the rings A and B, each independently of the other, are unsubstituted or substituted by cyano, nitro, halogen, lower alkyl, lower alkoxy or lower alkoxycarbonyl, and ring D is unsubstituted or substituted by cyano, nitro, halogen, lower alkyl, lower alkoxy, lower alkoxycarbonyl, unsubstituted or substituted phenyl or a fused benzene ring.

4,287,337
SPIROPYRAN COMPOUNDS OF PIPERIDINE OR THIAZINE RINGS

Robert J. Guglielmetti, Brest; Francis Garnier, Champigny; Yves M. Poirier, Brest, and Gisele M. C. Petillon, Briec, all of France, assignors to Etat Francais represente par le Delegue General pour l'Armement, Paris, France

Filed Nov. 21, 1979, Ser. No. 96,395
Claims priority, application France, Nov. 28, 1978, 78 33512
Int. Cl.³ C07D *515/10, 491/107*
U.S. Cl. 544—6 **6 Claims**

1. A spiropyran compound having the formula (I)



(I)

in which:

X represents a CH_2 group or a sulfur atom,

R_1 and R_2 are selected from the group consisting of NO_2, $—COC_6H_5$, —CN, the halogens, the alkoxy substituents, the hydrogen atom, the alkyl and mercaptoalkyl groups, the ethers of formula $—CH_2OR$, thioethers of the formula CH_2SR and amines of the formula $—CH_2NR_2$ in which R represents an alkyl group,

R_3 is a linear or branched alkyl group comprising from 1 to 18 carbon atoms, a phenylalkl group in which the linear or branched alkyl group has from 1 to 5 carbon atoms, or an alkenyl group having 2 to 10 carbon atoms;

R_4, R_5, R_6, R_7, R_8 and R_9 have one of the meanings indicated for R_3, represent a hydrogen atom, or participate, two by two, in the formation of a saturated homocycle of 5 to 10 carbon atoms, either with the group present on the same carbon atom or with the group in ortho position;

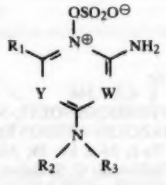
R_{10} represents a hydrogen atom if X=S and if $X=CH_2$ a hydrogen atom, an alkyl group having 1 to 18 carbon atoms, a phenylalkyl group in which the alkyl group has 1 to 5 carbon atoms, or an alkenyl group having 2 to 10 carbon atoms.

4,287,338
SULFOOXY-PYRIMIDINIUM, -PYRIDINIUM, AND -TRIAZINIUM HYDROXIDE INNER SALTS

John M. McCall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 10, 1980, Ser. No. 128,995
Int. Cl.³ C07D *213/89, 239/48, 251/18, 413/04*
U.S. Cl. 544—123 **8 Claims**

1. A compound of the formula II



II

wherein

(a) R_1 is selected from the group consisting of alkyl of from one to 8 carbon atoms, or NHR_4 wherein R_4 is hydrogen or alkyl of from one to 4 carbon atoms;

(b) R_2 and R_3 are the same or different and are hydrogen, alkyl of from one to 8 carbon atoms, with the proviso that if R_2 is hydrogen, R_3 is not hydrogen or methyl, and vice-versa, alkenyl of from 3 to 8 carbon atoms (excluding unsaturation at the carbon directly bonded to the nitrogen), phenylalkyl wherein the alkyl portion of the moiety is from one to 3 carbon atoms, cycloalkyl of from 3 to 8 carbon atoms, or R_2 and R_3 taken together with nitrogen form a heterocyclic moiety selected from the following: 1-aziridinyl, 1-azetidinyl, 1-pyrrolidinyl, 1-piperidinyl, hexahydro-1H-azepin-1-yl, hexahydro-1(2H)-azocinyl, 4-alkylpiperazinyl (wherein the alkyl portion of the moiety is of one to 3 carbon atoms), 4-morpholinyl, 4-thiomorpholinyl, 3,6-dihydro-1(2H)-pyridinyl, 3-pyrrolin-1-yl, 2,3,4,7-tetrahydro-1H-azepine-1-yl, and 3,4,7,8-tetrahydro-1(2H)-azocinyl,

said heterocyclic moieties optionally being substituted by one to 3 alkyl groups of from one to 3 carbon atoms, and

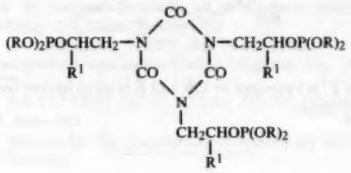
(c) W and Y are the same or different and are nitrogen or carbon; or the tautomeric or solvated forms thereof.

4,287,339
PHOSPHITE-ISOCYANURATES

Leo L. Valdiserri, Belpre, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Feb. 29, 1980, Ser. No. 126,142
Int. Cl.³ C07D *251/34*
U.S. Cl. 544—214 **4 Claims**

1. A phosphite-isocyanurate compound having the structural formula



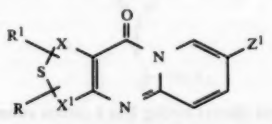
where R is a hydrocarbon radical having 1–14 carbon atoms and R^1 is methyl or hydrogen.

4,287,340
DIHYDRO-OXO-PYRIDO[1,2-A]THIENOPYRIMIDINE COMPOUNDS

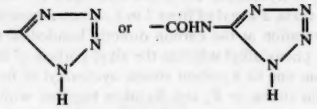
Francis J. Tinney; David T. Connor; Wiaczeslaw A. Cetenko; Joseph J. Kerbleski, and Roderick J. Sorenson, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 70,227, Aug. 27, 1979, Pat. No. 4,230,707. This application Mar. 21, 1980, Ser. No. 132,603
Int. Cl.³ C07D *495/14*
U.S. Cl. 544—250 **4 Claims**

1. A compound of the formula



and salts thereof, wherein X is $—CH_2—$ and X^1 is $—CH_2—$, X is $—CH_2CH_2—$ and X^1 is a single bond, and X is a single bond and X^1 is $—CH_2CH_2—$; Z^1 is CO_2 lower alkyl, cyclic hydrocarbon, cyano, carboxy,



and R and R^1 are hydrogen, lower alkyl, cyclic hydrocarbon, chloro, bromo, phenyl or x-substituted phenyl were x is lower alkyl, chloro, fluoro, cyclic hydrocarbon-O-, or lower alkyl —O—.

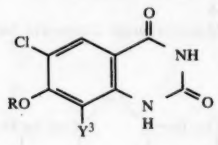
4,287,341

ALKOXY-SUBSTITUTED-6-CHLORO-QUINAZOLINE-2,4-DIONES

Hans-Jurgen E. Hess, Old Lyme; Jasjit S. Bindra, and Praful K. Shah, both of Groton, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 90,313, Nov. 1, 1979, abandoned. This application Mar. 3, 1980, Ser. No. 126,838
Int. Cl.³ C07D *239/96*
U.S. Cl. 544—285 **3 Claims**

1. A compound of the formula



wherein Y^3 is hydrogen or OR and R is alkyl having from 1 to 3 carbon atoms.

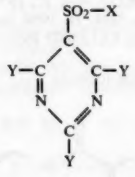
4,287,342

2,4,6-TRIHALO-5-ALKYL-AND 5-ALKENYLSULPHONYLPYRIMIDINES

Karl Hoegerle, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 903,633, May 8, 1978, Pat. No. 4,188,483. This application Aug. 10, 1979, Ser. No. 65,701
Claims priority, application Luxembourg, May 9, 1977, 77288
Int. Cl.³ C07D *239/38*
U.S. Cl. 544—298 **7 Claims**

1. A compound of the formula II



wherein

X represents alkenyl having 2 to 4 carbon atoms or alkyl of 1 to 6 carbon atoms which is unsubstituted or is substituted by substituents selected from the group consisting of 1 to 3 halogen, alkoxy having 1–6 carbon atoms, phenyl and naphthyl,

and each Y represents an identical or different halogen.

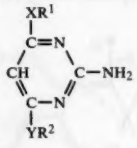
4,287,343

PREPARATION OF N-CYANOIMIDATE HERBICIDE INTERMEDIATES

Edward K. W. Wat, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 4, 1979, Ser. No. 81,807
Int. Cl.³ C07D *239/52*; C07C *125/08, 119/18*; C07D *239/58*
U.S. Cl. 544—320 **7 Claims**

1. A process for preparing a pyrimidine compound of the formula



where

X and Y are independently oxygen or sulfur;

R^1 and R^2 are independently C_1–C_4 alkyl, $(CH_2)_nOR^3$, CH_2CH_2Cl or CH_2CF_3;

R^3 is C_1–C_4 alkyl; and

n is 1 or 2;

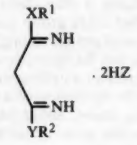
provided that:

(1) when R^1 is CH_2CH_2Cl or CH_2CF_3, then X is 0; and

(2) when R^2 is CH_2CH_2Cl or CH_2CF_3, then Y is 0;

comprising

(a) contacting a dihydrohalide salt of the formula:



where X, Y, R^1 and R^2 are as defined above; and where Z is F, Cl or Br,

with two mole equivalents of a base to produce a bisimidate; and

(b) contacting the bisimidate with cyanogen chloride to product a mixture of an N-cyanoimidate and a monohydrohalide bisimidate salt;

(c) isolating the N-cyanoimidate from the reaction mixture; and

(d) heating the resulting N-cyanoimidate at a temperature sufficient to induce ring closure.

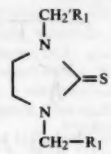
4,287,344

N,N-BIS-(DECAHYDROQUINOLYL-N-METHYL-)IMIDAZOLIN-2-THIONES

Abidzhan Safaev, "P" Ts-1, 26-a, kv. 28; Abduvasit Kadyrov, ulitsa Vavilova, 11; Zhakhongir G. Saidaliev, ulitsa 1 Sputnik, 7, and Tulyagan F. Faiziev, ulitsa Almazar, Shelkomotalny proezd, 31-a, all of Tashkent, U.S.S.R.

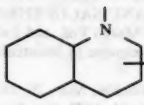
Filed Aug. 3, 1977, Ser. No. 821,560
Int. Cl.³ C07D *401/14*
U.S. Cl. 546—164 **6 Claims**

1. N,N'-bis-substituted imidazolin-2-thiones of the formula:



(I)

wherein
R_1 is



(II)

R_2 is hydrogen, methyl.

4,287,345

POLYFUNCTIONAL DISULFIDE COMPOUNDS HAVING S—S EXCHANGE REACTIVITY

Kikuo Kotani; Kunio Ohyama; Nobuaki Nakagawa, all of Shizuoka; Tadashiro Fujii, Mishima, and Susumu Watanabe, Shizuoka, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

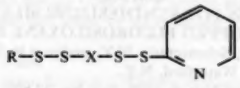
Filed Jan. 11, 1980, Ser. No. 111,482

Claims priority, application Japan, May 4, 1979, 54-41737; Dec. 1, 1979, 54-3507

Int. Cl.³ C07D *213/70*

U.S. Cl. 546—261 **4 Claims**

1. A polyfunctional disulfide compound of the formula



[I]

wherein R is 2-benzothiazolyl or 2-pyridyl-N-oxide and X is a $C_{2\text{-}10}$ spacer group which may have hydroxy substituents, amide linkage or ether linkage having an alkylene group directly bonded to each S-S group.

4,287,346

CYANOGUANIDINE DERIVATIVES

Satoru Tanaka, Higashi-Kurume; Katsutoshi Shimada, Tokyo; Kazunori Hashimoto, Matsudo; Kiichi Ema, and Koichiro Udea, both of Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

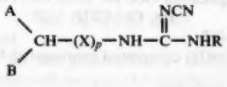
Filed Feb. 12, 1980, Ser. No. 120,876

Claims priority, application Japan, Feb. 16, 1979, 54/15989; Feb. 16, 1979, 54/15990

Int. Cl.³ C07D *213/57, 405/06, 409/06*

U.S. Cl. 546—330 **12 Claims**

1. A cyanoguanidine derivative of the formula:



wherein A represents phenyl; phenyl substituted by lower alkyl, lower alkenyl, halogen, lower alkoxy, lower alkylthio, lower alkylsulfonyl or halo lower alkyl; furyl; thienyl or cycloalkyl of 5 to 6 carbon atoms;

B represents pyridyl or pyridine-N-oxide;

R represents lower alkyl or lower alkenyl;

X represents lower alkylene or lower alkylene having a terminal sulfur atom; and

p is 0 or 1, with the proviso that (i) when A is unsubstituted phenyl, B is pyridine-N-oxide and (ii) when A is unsubstituted phenyl and B is pyridine-N-oxide, p is 0, or a pharmaceutically acceptable acid addition salt thereof.

4,287,347

PROCESS FOR PRODUCING 2,3,5-TRICHLOROPYRIDINE

Hansjakob Fäh, Ettingen, and Alfred Grieder, Böckten, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 12, 1980, Ser. No. 148,849

Int. Cl.³ C07D *213/02*

U.S. Cl. 546—345 **1 Claim**

1. A process for producing 2,3,5-trichloro-pyridine which comprises suspending in a mixture of toluene and water, 3,5-dichloro-pyridone, the water present is separated by azeotropic distillation, adding 0.05–0.15 mol of N,N-dimethylformamide per mol of 3,5-dichloro-2-pyridone introducing, 1.0–1.3 mols of phosgene per mol of 3,5-dichloro-2-pyridone at 75°–80° C., stirring the reaction mixture further for 1 hour, reacting the excess phosgene with aqueous ammonia, separating the phases, and obtaining from the organic phase, after removal of the solvent by distillation, the formed 2,3,5-trichloro-pyridine in the form of a melt.

4,287,348

PREPARATION OF SULPHOALKYL QUATERNARY SALTS

Rainer Kitzing, Ingatestone; Geoffrey E. Ficken, Ilford, and Victor W. Dolden, Romford, all of England, assignors to Ciba-Geigy AG, Basel, Switzerland

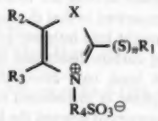
Filed Jun. 5, 1978, Ser. No. 912,702

Claims priority, application United Kingdom, Jun. 10, 1977, 24299/77

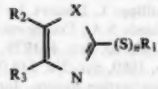
Int. Cl.³ C07D *293/12, 277/62, 263/54, 235/04*

U.S. Cl. 548—121 **8 Claims**

1. A process for the preparation of quaternary salts of the general formula



wherein X is —O—, —Se—, —S—, —NR— or —CR(R)—, wherein R is alkyl of 1 to 4 carbon atoms or hydrogen, R_1 is hydrogen, methyl or ethyl, R_2 and R_3 are each hydrogen, alkyl or hydroxyalkyl of 1 to 4 carbon atoms, phenyl, halogen or halogenated alkyl or together they represent the atoms to complete a benzene ring which is unsubstituted or substituted by methyl, ethyl, trifluoromethyl, chlorine, bromine and or and R_4 is an alkylene chain having 3 or 4 carbon atoms in the chain and n is 1 or 0, except that when n is 1, R_1 cannot be hydrogen, which comprises heating at a temperature above 80° C., a heterocyclic base of the general formula



where X, R_1, R_2 and R_3 and n have the indicated meanings with a hydroxysulphonic acid of the general formula

$HO—R_4—SO_3H$

where R_4 has the indicated meaning under conditions so that the water formed is removed from the reacting mixture.

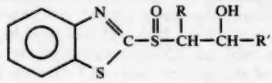
4,287,349

BETA-ALKYL (OR ARYL) BETA-HYDROXYETHYL HETEROCYCLIC SULFOXIDES

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 23, 1979, Ser. No. 32,269
Int. Cl.[3] C07D *277/64;* C07G *13/00*
U.S. Cl. 548—166 **5 Claims**

1. A beta-alkyl beta-hydroxyethyl 2-benzothiazolyl sulfoxide of the formula



wherein R is hydrogen and R′ is selected from the group consisting of alkyl groups of 1 to 22 carbon atoms, phenyl and hydrogen.

4,287,350

PROCESS FOR THE PREPARATION OF THIAZOLIDINE-2-THIONES

Dieter Hüllstrung, Leverkusen, and Jürgen Trimbach, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 19, 1980, Ser. No. 131,807
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1979, 2911661
Int. Cl.[3] C07D *277/04*
U.S. Cl. 548—182 **8 Claims**

1. A process for the production of thiazolidine-2-thiones by the reaction of 1 mol of an amino ethanol with from 2 to 2.1 mol of carbon disulphide at from 20° to 200° C. and from 0.1 to 5 bar pressure, characterised in that the liquid phase containing amino ethanol is brought into intimate contact with the gaseous phase containing carbon disulphide in a continuous single stage process in at least two consecutive reaction zones, wherein the liquid phase is introduced continuously into the first reaction zone, conveyed toward the last reaction zone and removed downstream of the last reaction zone and wherein the gaseous phase is introduced continuously into the last reaction zone, conveyed toward the first reaction zone and removed downstream of the first reaction zone.

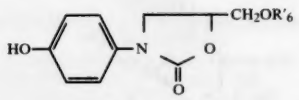
4,287,351

3-PARAHYDROXYPHENYL-5-METHYLETHER-2-OXAZOLIDINONE COMPOUNDS

Guy R. Bourgery, Colombes; Colette A. Douzon, Paris; Jean-Francois R. Ancher, Rueil-Malmaison; Alain P. Lacour, La Varenne; Patrick G. Guerret, Rueil-Malmaison; Michel Langlois, Buc, and Phillippe L. Dostert, Le Vesinet, all of France, assignors to Delalande S.A., Courbevoie, France

Division of Ser. No. 45,143, Jun. 4, 1979. This application Feb. 6, 1980, Ser. No. 119,073
Claims priority, application France, Jun. 9, 1978, 78 178388; Aug. 17, 1978, 78 24024
Int. Cl.[3] C07D *263/24;* A61K *31/42*
U.S. Cl. 548—232 **8 Claims**

1. A compound having the formula



wherein R'_6 is a linear or branched alkyl having 1 to 5 carbon atoms, cyclohexyl or methoxymethyl.

4,287,352

PROCESS FOR PREPARING ALPHA-THIENYLACETIC ACID, ESTERS AND SALTS THEREOF

Alessandro Moro, Pernate; Marco Foà, and Luigi Cassar, both of Novara, all of Italy, assignors to Montedison, S.p.A., Milan, Italy

Continuation of Ser. No. 888,396, Mar. 20, 1978, abandoned. This application Jul. 24, 1979, Ser. No. 60,225
Int. Cl.[3] C07D *333/16*
U.S. Cl. 549—79 **7 Claims**

1. A process for preparing alpha-thienylacetic acid, alkyl esters and salts thereof by carbonylation of 2-chloromethylthiophene, characterized in that 2-chloromethylthiophene and carbon monoxide are reacted under atmospheric pressure and at a temperature ranging from 0° to 60° C., in an aqueous-alcoholic solution in the presence of a catalyst selected from the class consisting of (a) $Co_2(CO)_8$, (b) $MCo(CO)_4$ where M is selected from the class consisting of Na and K, and (c) a system comprising a cobalt salt, a ferromanganese alloy and at least one sulphur-containing promoter, and in the presence of an inorganic base, and then separating the alpha-thienylacetic acid from the resulting salt and/or ester obtained.

4,287,353

PROCESS FOR SYNTHESIZING SILANOL CHAIN-STOPPED FLUOROSILOXANE FLUIDS

Ben A. Bluestein, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Nov. 9, 1979, Ser. No. 92,800
Int. Cl.[3] C07P *7/08*
U.S. Cl. 556—459 **11 Claims**

1. A process for producing a silanol chain-stopped fluorosilicone fluid, comprising: reacting at 25° C. to 100° C., 100 parts by weight of a cyclic fluorosiloxane trimer with a mixture of, approximately, 0.02 to 5.0 parts water and, approximately, 0.0050 to 0.10 parts polymerization catalyst and, approximately, 0.010 to 2.0 parts of polyethyleneglycol dimethyl ether promoter and adding an amount of neutralizer effective for stopping the polymerization at the desired viscosity.

4,287,354

TELLURIUM(II) COMPOUNDS AND COMPLEXES HAVING ORGANIC MOIETIES CONTAINING SILICON

Henry J. Gysling, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 965,712, Dec. 1, 1978, Pat. No. 4,258,128. This application Oct. 20, 1980, Ser. No. 198,690
Int. Cl.[3] C07F *7/08*
U.S. Cl. 556—465 **6 Claims**

1. A tellurium(II) compound represented by the formula:

$$Te[(CH_2)_nSiRR'R'']_2$$

wherein:

n is an integer from 1 to 10 and

R, R′ and R″ are independently selected from the group consisting of alkyl, aryl and heterocyclic radicals.

4,287,355

CARBOXYL-(PHENYL OR TOLYL)-SULFONIUM SALTS

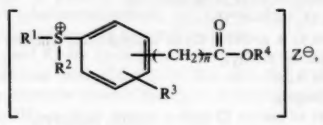
Faizulla G. Kathawala, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 88,826, Oct. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 929,424, Jul. 31, 1978, abandoned. This application Jul. 21, 1980, Ser. No. 170,569

Int. Cl.³ A01N 9/12; A61K 31/235

U.S. Cl. 560—18 27 Claims

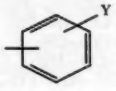
1. A compound of the formula:



wherein

R^1 is alkyl having from 8 to 24 carbon atoms;

R^2 is alkyl having from 1 to 6 carbon atoms or unsubstituted or substituted phenyl of the formula:



wherein

Y is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkyl of from 1 to 4 carbon atoms, or alkoxy of from 1 to 4 carbon atoms;

R^3 is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkyl having from 1 to 3 carbon atoms or alkoxy having from 1 to 3 carbon atoms;

R^4 is a hydrogen atom, or alkyl having from 1 to 6 carbon atoms;

n is 0 or 1; and

$Z^{\ominus}$ is an anion forming a pharmaceutically acceptable non-toxic salt of the corresponding cation;

provided that R^4 is alkyl when R^2 is other than alkyl.

4,287,356

PREPARATION OF VINYLGLYCOL ESTERS

Hans-Martin Weitz, Bad Durkheim, and Rolf Fischer, Heidelberg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 27, 1979, Ser. No. 97,813

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1978, 2854154

Int. Cl.³ C07C 67/05

U.S. Cl. 560—244 2 Claims

1. A process for the preparation of vinylglycol esters by reacting butadiene with oxygen and a carboxylic acid selected from the group consisting of formic acid, acetic acid and propionic acid in the liquid phase over a palladium-containing supported catalyst, wherein the catalyst used contains from 0.1 to 20 percent by weight of palladium and from 2.5 to 7 percent by weight of cobalt and has been heated at 400°–900° C. for from 15 minutes to 4 hours.

4,287,357

PROCESS FOR THE PRODUCTION OF 6-HYDROXY-2-NAPHTHOIC ACID

Michael J. Mueller, Parkersburg, W. Va., and Carroll S. Montgomery, Somerville, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 6, 1980, Ser. No. 127,703

Int. Cl.³ C07C 51/15

U.S. Cl. 562—425 7 Claims

1. In a process for preparing 6-hydroxy-2-naphthoic acid by reacting essentially anhydrous potassium 2-naphthoxide with carbon dioxide at an elevated temperature, and recovering 6-hydroxy-2-naphthoic acid therefrom, the improvement which comprises forming a mixture of 2-hydroxynaphthalene and a potassium base, using about 0.8 to 1.2 moles of 2-hydroxynaphthalene per equivalent of potassium base; dehydrating said mixture; introducing carbon dioxide into said dehydrated mixture at about 20 psi to 90 psi at about 255° C. to 280° C., while agitating said mixture in a pressure reactor; and heating said agitated mixture at said temperature and under said pressure until the ratio of 6-hydroxy-2-naphthoic acid to 3-hydroxy-2-naphthoic acid in the reaction mixture is at least 2, before recovering said 6-hydroxy-2-naphthoic acid.

4,287,358

13,14-DIHYDRO-INTER-OXA-9-DEOXY-9-METHYLENE-19-OXO-PGF$_1$ COMPOUNDS

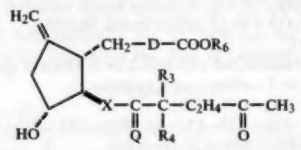
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 131,730

Int. Cl.³ C07C 177/00

U.S. Cl. 562—503 4 Claims

1. A compound of the formula



wherein D is

(1) $(CH_2)_3—O—CH_2—$,

(2) $(CH_2)_2—O—(CH_2)CH_2—$, or

(3) $—CH_2—O—(CH_2)_3—$,

wherein Q is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;

wherein R_6 is

(a) hydrogen,

(b) alkyl of one to 12 carbon atoms, inclusive,

(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,

(d) aralkyl of 7 to 12 carbon atoms, inclusive,

(e) phenyl,

(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,

(g) —(p-Ph)—CO—CH_3,

(h) —(p-Ph)—NH—CO—(p-Ph)—NH—CO—CH_3,

(i) —(p-Ph)—NH—CO—(p-Ph),

(j) —(p-Ph)—NH—CO—CH_3,

(k) —(p-Ph)—NH—CO—NH_2,

(l) —(p-Ph)—CH=N—NH—CO—NH_2,

(m) β-naphthyl,

(n) $—CH_2—CO—R_{28}$,

wherein (p-Ph) is para-phenyl or inter-para-phenylene,

wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or

(o) a pharmacologically acceptable cation;

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and

wherein X is $-CH_2CH_2-$.

4,287,359

13,14-DIHYDRO-INTER-OXA-11-DEOXY-11-HYDROXYMETHYL-19-OXO-PGF$_1$ COMPOUNDS

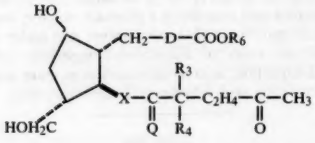
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979, abandoned. This application Mar. 20, 1980, Ser. No. 132,001

Int. Cl.^{3} C07C *177/00*

U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is

(1) $(CH_2)_3—O—CH_2—$,

(2) $(CH_2)_2—O—(CH_2)CH_2—$, or

(3) $—CH_2—O—(CH_2)_3—$,

wherein Q is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;

wherein R_6 is

(a) hydrogen,

(b) alkyl of one to 12 carbon atoms, inclusive,

(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,

(d) aralkyl of 7 to 12 carbon atoms, inclusive,

(e) phenyl,

(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,

(g) $—(p—Ph)—CO—CH_3$,

(h) $—(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3$,

(i) $—(p—Ph)—NH—CO—(p—Ph)$,

(j) $—(p—Ph)—NH—CO—CH_3$,

(k) $—(p—Ph)—NH—CO—NH_2$,

(l) $—(p—Ph)—CH=N—NH—CO—NH_2$,

(m) β—naphthyl,

(n) $—CH_2—CO—R_{28}$,

wherein (p—Ph) is para-phenyl or inter-para-phenylene,

wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or

(o) a pharmacologically acceptable cation;

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and

wherein X is $-CH_2CH_2-$.

4,287,360

13,14-DIHYDRO-INTER-OXA-11-DEOXY-11-HYDROXYMETHYL-19-OXO-PGE$_1$ COMPOUNDS

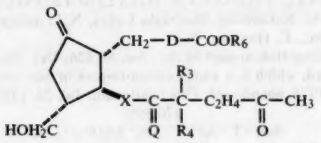
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,002

Int. Cl.^{3} C07C *177/00*

U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is

(1) $(CH_2)_3—O—CH_2—$,

(2) $(CH_2)_2—O—(CH_2)CH_2—$, or

(3) $—CH_2—O—(CH_2)_3—$,

wherein Q is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;

wherein R_6 is

(a) hydrogen,

(b) alkyl of one to 12 carbon atoms, inclusive,

(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,

(d) aralkyl of 7 to 12 carbon atoms, inclusive,

(e) phenyl,

(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,

(g) $—(p—Ph)—CO—CH_3$,

(h) $—(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3$,

(i) $—(p—Ph)—NH—CO—(p—Ph)$,

(j) $—(p—Ph)—NH—CO—CH_3$,

(k) $—(p—Ph)—NH—CO—NH_2$,

(l) $—(p—Ph)—CH=N—NH—CO—NH_2$,

(m) β-naphthyl,

(n) $—CH_2—CO—R_{28}$,

wherein (p—Ph) is para-phenyl or inter-para-phenylene,

wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or

(o) a pharmacologically acceptable cation;

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and

wherein X is $—CH_2CH_2—$.

4,287,361

13,14-DIHYDRO-INTER-OXA-11-DEOXY-19-OXO-PGF$_1$ COMPOUNDS

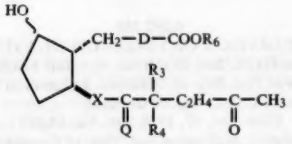
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,004

Int. Cl.^{3} C07C *177/00*

U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is

(1) $(CH_2)_3—O—CH_2—$,

(2) $(CH_2)_2—O—(CH_2)CH_2—$, or

(3) $—CH_2—O—(CH_2)_3—$,

wherein Q is $\alpha—OH$:$\beta—R_5$ or $\alpha—R_5$:$\beta—OH$, wherein R_5 is hydrogen or methyl; wherein R_6 is

(a) hydrogen,

(b) alkyl of one to 12 carbon atoms, inclusive,

(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,

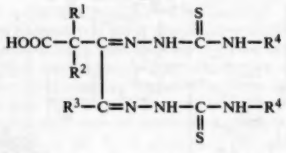
(d) aralkyl of 7 to 12 carbon atoms, inclusive,

(e) phenyl,

(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—CH_3,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—CH_3,
(k) —(p—Ph)—NH—CO—NH_2,
(l) —(p—Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{28},
wherein (p—Ph) is para-phenyl or inter-para-phenylene, wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and wherein X is —CH_2CH_2—.

4,287,362
2-OXOPROPIONALDEHYDE BIS(THIOSEMICARBAZONE) DERIVATIVES
Akira Yokoyama, Otsu, and Yasushi Arano, Obatamachi, both of Japan, assignors to Nihon Medi-Physics Co., Ltd., Hyogo, Japan
Filed Jan. 18, 1980, Ser. No. 113,341
Claims priority, application Japan, Aug. 29, 1979, 54/110821; Aug. 29, 1979, 54/110822
Int. Cl.³ C07C *157/05, 103/52;* **A61K** *43/00*
U.S. Cl. 562—556 **4 Claims**

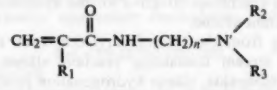
1. A bifunctional chelating compound of the formula:



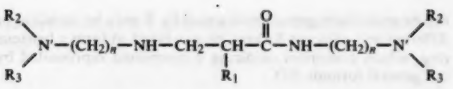
wherein R^1, R^2, R^3 and R^4 are each a hydrogen atom or a C_1–C_3 alkyl group.

4,287,363
PREPARATION OF N-(ALKYLAMINOALKYL)ACRYLAMIDES
Edward E. McEntire, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.
Filed Sep. 2, 1980, Ser. No. 183,596
Int. Cl.³ C07C *102/00*
U.S. Cl. 564—205 **6 Claims**

1. An improved catalytic process for the preparation of N-(alkylaminoalkyl)acrylamides of the formula



wherein R_1 is H or methyl; n is an integer from 2 to 6; and R_2 and R_3, taken singly are hydrogen or lower alkyl groups containing 1 to 4 carbon atoms, with at least one occurrence of R_2 and R_3 being lower alkyl, or R_2 and R_3, taken jointly are combined with the N' atom to form a heterocyclic group selected from the group consisting of morpholine, pyrollidine or piperidine ring groups; which process comprises
subjecting a β-aminopropionamide of the formula



wherein R_1, n, R_2 and R_3 are same as above, to a temperature of about 100° C. to about 250° C. in the presence of a catalyst selected from the group consisting of calcium, magnesium and aluminum salts of strong acids; and
separating the resultant product, a N-(alkylaminoalkyl)acrylamide compound.

4,287,364
MOLYBDENUM CATALYST FOR ANILINE-FORMALDEHYDE CONDENSATION
Edward T. Marquis; Robert M. Gipson, and Lewis W. Watts, Jr., all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.
Filed Sep. 24, 1980, Ser. No. 190,531
Int. Cl.³ C07C *85/145*
U.S. Cl. 564—332 **3 Claims**

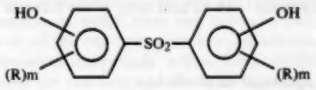
1. A method of preparing diaminodiphenylmethane and higher homologues thereof which comprises the step of condensing aniline and formaldehyde in the presence of an molybdenum aluminide catalyst.

4,287,365
REDUCTION OF AROMATIC NITRO COMPOUNDS WITH RANEY NICKEL CATALYST
Hans-Joachim Becker, Leverkusen, Fed. Rep. of Germany and Walter Schmidt, deceased, late of Leverkusen, Fed. Rep. of Germany, by Hildegard Schmidt, heiress assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Continuation of Ser. No. 876,808, Feb. 10, 1978, abandoned, which is a division of Ser. No. 806,237, Jun. 13, 1977, abandoned. This application Jun. 11, 1979, Ser. No. 47,420
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1977, 2713374
Int. Cl.³ C07C *85/11*
U.S. Cl. 564—422 **3 Claims**

1. In a process for the hydrogenation of an organic aromatic nitro compound which comprises hydrogenating said organic compound in the presence of a Raney nickel catalyst, the improvement which comprises using, as the Raney nickel catalyst, one which contains about 12.8 to 25% by weight of iron, relative to the sum of the active components nickel and iron.

4,287,366
PROCESS FOR PREPARING BISPHENOL SULFONE DERIVATIVES
Akihiro Yamaguchi, Yokohama; Keizaburo Yamaguchi, Kawasaki; Hisamichi Murakami, and Tadashi Kobayashi, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan
Filed Mar. 10, 1980, Ser. No. 128,712
Int. Cl.³ C07C *147/10*
U.S. Cl. 568—33 **13 Claims**

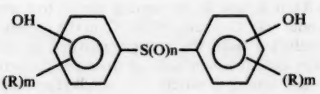
1. A process for preparing a bisphenol sulfone compound represented by the general formula (I)



(I)

where R stands for hydrogen, a halogen, an alkyl group, a cycloalkyl group, an aryl group, an aralkyl group, hydroxyl group, an alkoxy group, allyloxy group, carboxyl group, or a carboalkoxy group, m is an integer of from 1 to 3, and when m

is 2 or more each group represented by R may be identical or different and adjacent Rs may be combined to form a benzene ring, which comprises oxidizing a compound represented by the general formula (II)



(II)

where R and m have the same meanings as defined for the compounds of formula (I), and n is zero or 1, with hydrogen peroxide in the presence of an alkali metal hydroxide, the amount of said alkali metal hydroxide being equimolar relative to said compound of formula (II) in water or in water plus an organic solvent which does not form any organic peracids under reaction conditions to form said bisphenol sulfone compound, said organic solvent being selected from the group consisting of aliphatic, alicyclic and aromatic hydrocarbons, halogenated aliphatic, alicyclic and aromatic hydrocarbons, alcohols, ethers, esters, ketones, aprotic polar solvents, carbon disulfide, and mixtures thereof.

4,287,367
MANUFACTURE OF SYMMETRICAL OR UNSYMMETRICAL MONOACETALS OF AROMATIC 1,2-DIKETONES

Werner Kuesters, and Lucien Thil, both of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

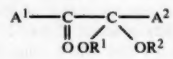
Continuation-in-part of Ser. No. 973,733, Dec. 27, 1978, abandoned, which is a continuation of Ser. No. 787,583, Apr. 14, 1977, abandoned, and a continuation-in-part of Ser. No. 935,623, Aug. 21, 1978, abandoned, which is a division of Ser. No. 787,569, Apr. 14, 1977, Pat. No. 4,144,156. This application Jul. 30, 1980, Ser. No. 173,703

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1976, 2616382; Apr. 14, 1976, 2616408; Apr. 14, 1976, 2616588

Int. Cl.³ C07C *41/56*

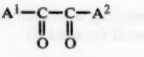
U.S. Cl. 568—43 **28 Claims**

1. A process for the manufacture of monoacetals of aromatic 1,2-diketones, of the formula (I)



(I)

where A^1 and A^2 are identical or different aromatic radicals each of which has 6 to 12 carbon atoms and may or may not bear from one to four hydrocarbon readicals of 1 to 10 carbon atoms, alkoxy radicals of 1 to 10 carbon atoms, alkoxyalkyl radicals of 2 to 10 carbon atoms, alkylthio radicals of 1 to 6 carbon atoms and/or halogen as substituents, and R^1 and R^2 are identical or different hydrocarbon radicals 1 to 12 carbon atoms in which the chain may or may not be interrupted by —O— or —S— or bear a halogen, which comprises reacting aromatic 1,2-diketones of the formula (II)



(II)

in an organic solvent with an acid ester of the formula

$$(R^1)_nX$$

as alkylating agent and an alcoholate

$$(R^2O)_mMe$$

where A^1, A^2, R^1 and R^2 have the above meanings, n and m are integers from 1 to 3, X is a monobasic, dibasic or tribasic acid radical and Me is a metal of main groups 1 to 3 of the periodic table of the elements.

4,287,368
METHOD FOR PREPARING VANILLIN AND COMPOSITION THEREFOR

Garland A. Johnson, Charleston Township, Kalamazoo County, and Jacob D. Peuler, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 950,863, Oct. 12, 1978, Pat. No. 4,242,222, which is a division of Ser. No. 681,999, Apr. 30, 1976, abandoned. This application Feb. 26, 1980, Ser. No. 124,825

Int. Cl.³ C07C *45/30*

U.S. Cl. 568—436 **4 Claims**

1. A method for oxidizing metanephrine or normetanephrine to vanillin which comprises contacting the metanephrine or normetanephrine with periodate in the contact presence of silica gel.

4,287,369
HYDROFORMYLATION OF ALKENES TO ALDEHYDES

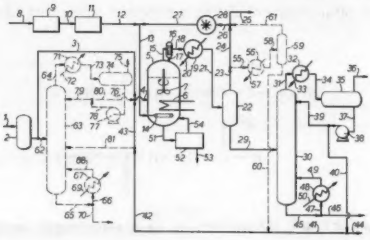
Norman Harris, and Thomas F. Shevels, both of Stockton-on-Tees, England, assignors to Davy McKee (Oil & Chemicals) Limited, London, England

Filed Mar. 20, 1980, Ser. No. 132,291

Claims priority, application United Kingdom, Mar. 21, 1979, 10011/79; European Pat. Off., Nov. 28, 1979, 79302708.7

Int. Cl.³ C07C *45/50*

U.S. Cl. 568—454 **15 Claims**



1. A process for the production of an aldehyde by hydroformylation of an alkene in the presence of a rhodium complex catalyst comprising:

providing a hydroformylation zone containing a liquid charge comprising (a) a rhodium complex catalyst wherein rhodium is in complex combination with carbon monoxide and a triorganophosphine, (b) excess triorganophosphine, (c) liquid aldehyde product, and (d) polymeric aldehyde condensation products;

feeding liquid reactant alkene to the hydroformylation zone;

supplying make up hydrogen and carbon monoxide to the hydroformylation zone;

maintaining in the hydroformylation zone temperature and pressure conditions effective for the hydroformylation of the reactant alkene;

recovering from the hydrofromylation zone an overhead vapour stream containing reactant alkene, hydrogen, carbon monoxide, alkene hydrogenation product(s), aldehyde product and aldehyde condensation products;

subjecting the vapour stream to condensation conditions to condense therefrom condensible components comprising unreacted alkene, aldehyde product, and aldehyde condensation products;

recycling non-condensed components of the vapour stream comprising hydrogen and carbon monoxide to the hydroformylation zone;

recovering aldehyde product; and

recycling unreacted alkene in liquid form to the hydroformylation zone.

4,287,370

HYDROFORMYLATION PROCESS FOR THE PRODUCTION OF N-VALERALDEHYDE

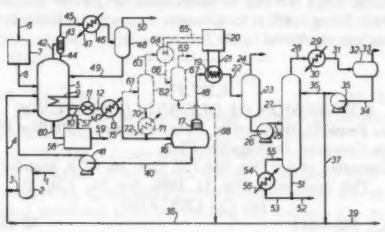
Norman Harris, Stockton-on-Tees; Alan J. Dennis, Acklam, and Thomas F. Shevels, Stockton-on-Tees, all of England, assignors to Davy McKee (Oil & Chemicals) Limited, London, England

Filed Mar. 20, 1980, Ser. No. 132,292

Claims priority, application United Kingdom, Mar. 21, 1979, 10012/79; European Pat. Off., Nov. 28, 1979, 79302709.5

Int. Cl.³ C07C *45/50*

U.S. Cl. 568—454 **14 Claims**



1. A process for the production of n-valeraldehyde by selective hydroformylation of butene-1 in the presence of at least one other C_4-olefin which comprises contacting a C_4-olefin feedstock with carbon monoxide and hydrogen in a hydroformylation zone in the presence of a catalytic quantity of a rhodium complex catalyst, said C_4-olefin feedstock comprising butene-1 and at least one other C_4-olefin selected from cis-butene-2, trans-butene-2, and iso-butylene and said rhodium complex catalyst comprising rhodium in complex combination with carbon monoxide and a triorganophosphine ligand, and in the presence of at least about 100 moles of free triorganophosphine ligand per gram atom of rhodium, at a temperature in the range of from about 80° C. to about 130° C., and at a total pressure of not more than about 50 kg/cm^2 absolute, the partial pressure of carbon monoxide being less than about 1.5 kg/cm^2 absolute and the partial pressure of hydrogen being in the range of from about 1.0 to about 7.5 kg/cm^2 absolute, and recovering from the hydroformylation zone unreacted C_4-olefins and n-valeraldehyde, said unreacted C_4-olefins including substantially all of said at least one other C_4-olefin present in the feedstock.

4,287,371

NOVEL PEROXYKETALS DERIVED FROM ALKOXYACETONES

Wilhelmus M. Beyleveld, Olst, and Lodewijk Roskott, Gorssel, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

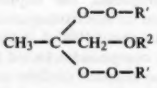
Continuation of Ser. No. 923,505, Jul. 10, 1978, abandoned. This application Oct. 22, 1979, Ser. No. 87,031

Claims priority, application Netherlands, Jul. 15, 1977, 7707887

Int. Cl.³ C07C *179/093*

U.S. Cl. 568—563 **4 Claims**

1. Novel peroxyketals having the general formula:



wherein R′ represents a tert.alkyl group having 4–12 carbon atoms and R^2 a branched or non-branched alkyl group having 1–12 carbon atoms or a substituted or unsubstituted cycloalkyl group having 5–12 carbon atoms.

4,287,372

PREPARATION OF NITRO-SUBSTITUTED DIPHENYL ETHERS

Michael D. Tufano, Broadview, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 11, 1979, Ser. No. 83,925

Int. Cl.³ C07C *43/275*

U.S. Cl. 568—635 **5 Claims**

1. A method for the preparation of a nitro-substituted diphenyl ether which comprises reacting an alkali metal salt of phenol possessing at least one moiety on the ring of said phenol selected from the group consisting of alkyl, aryl, alkaryl, hydroxy, alkoxy, aryloxy, amino, alkylamino, dialkylamino, nitro and alkylthio moieties with a nitrosubstituted halobenzene having the halo moiety substituted to the aromatic ring of said nitro-substituted halobenzene to effect the arylation of said phenol in the presence of a phase-transfer agent represented by the formula

$$R_1R_2R_3R_4Z^+Y^-$$

wherein R is equal to an alkyl or aralkyl moiety possessing from 1 to 20 carbon atoms, Z is equal to nitrogen or phosphorous and Y is a halide, at a reaction temperature of about 50° to about 200° C. for a period of time equivalent to about 0.5 to about 20 hours.

4,287,373

PERBROMINATION OF PHENOL AND DIPHENYL ETHER AT ELEVATED TEMPERATURE USING BROMINE AS THE REACTION MEDIUM

John A. Garman; Rastko I. Mamuzic; Robert B. McDonald; John L. Sands, all of West Lafayette, and Gregory Thompson, Battleground, all of Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

Continuation-in-part of Ser. No. 39,267, May 16, 1979, abandoned, which is a continuation of Ser. No. 858,653, Dec. 8, 1977, abandoned. This application Oct. 1, 1979, Ser. No. 81,035

Int. Cl.³ C07C *41/22, 37/62*

U.S. Cl. 568—639 **12 Claims**

1. A process for substantially perbrominating an aromatic compound selected from the group consisting of phenol and diphenyl ether comprising the steps of:

adding the aromatic compound at an elevated initial temperature of from about 35° C. up to about 55° C. to a mixture of:

at least a 75% excess and not more than about a 400% excess of the stoichiometric amount of bromine; and

a small but catalytically effective amount of a catalyst selected from the group consisting of iron, iron halides, iron compounds which form iron bromides under the conditions of the reaction, aluminum, aluminum halides, and aluminum compounds which form aluminum bromide under the conditions of the reaction; and

continuing the reaction at an elevated temperature at which reflux can occur after addition of the aromatic compound has been completed while maintaining the excess of bromine in order to achieve substantial perbromination of the aromatic compound.

4,287,374

PROCESS FOR THE PRODUCTION OF FLUORONITROBENZENES

Robert A. North, Nottingham, England, assignor to The Boots Company, Nottingham, England

Filed Oct. 1, 1979, Ser. No. 80,616

Claims priority, application United Kingdom, Oct. 5, 1978, 39512/78

Int. Cl.[3] C07C *79/12*

U.S. Cl. 568—937 13 Claims

1. A process for the production of a mono fluoronitrobenzene in which a mono chloronitrobenzene is heated with an alkali metal fluoride and a phase transfer catalyst at a temperature of no more than 200° C.

4,287,375

PROCESS OF CONVERTING ETHYLBENZENE TO STYRENE BY CATALYTIC DEHYDROGENATION

Friedrich-Wilhelm Möller, Friedrichsdorf; Henning Buchold, Maintal; Helmut Klein, Hanau; Otto-Ludwig Garkisch, Bad Soden; Friedrich Gütlhuber, Metten, and Walter Laber, Deggendorf, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 11, 1980, Ser. No. 129,460

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1979, 2909763

Int. Cl.[3] C07C *5/333*

U.S. Cl. 585—440 3 Claims

1. In a process of converting ethylbenzene to styrene by catalytic dehydrogenation at a temperature about 600° C. in the presence of water vapor in a tubular reactor, the improvement which comprises supplying heat to said tubular reactor in the form of a molten salt bath, consisting essentially of a mixture of sodium carbonate, potassium carbonate and lithium carbonate, effecting dehydrogenation isothermally in said tubular reactor in a single stage under atmospheric pressure or under a subatmospheric pressure and with a water vapor-ethylbenzene ratio of 1.2–1.5 kg steam per kg ethylbenzene, the temperature of the ethylbenzene/water vapor mixture introduced into the tubular reactor being 50° to 100° C. below the temperature of the molten salt bath.

4,287,376

METHOD FOR ARALKYLATION

Isoo Shimizu; Okitsugu Tsuji, both of Yokohama; Eiichi Matsuzaka, and Atsushi Sato, both of Tokyo, all of Japan, assignors to Nippon Petrochemicals Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1979, Ser. No. 60,662

Claims priority, application Japan, Aug. 10, 1978, 53-97537

Int. Cl.[3] C07C *2/66*

U.S. Cl. 585—458 10 Claims

1. In a method of aralkylation of at least one member selected from the group consisting of benzene and alkylbenzenes each having an alkyl group or groups of 1 to 18 in total carbon atom number by reacting at least one aromatic olefin each having a double bond or double bonds which are conjugated with the benzene ring thereof with said at least one member, the improvement in said method comprising carrying out said aralkylation in the presence of at least one catalyst selected from the group of compounds represented by the general formula:

$$C_nF_{2n+1-m}Cl_mSO_3H,$$

in which the symbol n is an integer from 1 to 5, inclusive, and m is 0 (zero) or 1.

4,287,377

HYDROCARBON CONVERSION

Raymond Maslin, Acklam, and Bodo Linnhoff, Hoole, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jul. 24, 1979, Ser. No. 60,126

Claims priority, application United Kingdom, Aug. 7, 1978, 32468/78

Int. Cl.[3] C07C *2/00, 5/00*

U.S. Cl. 585—634 8 Claims

1. A process for hydrocarbon conversion which comprises converting a hydrocarbon feedstock in a heated furnace to produce hydrocarbon process gas wherein the furnace is heated by burning a mixture of fuel and preheated air, the preheated air having been obtained by passing air through successive compression, heating and gas turbine expansion zones, the work thereby obtained from the gas turbine expansion zone being used, at least in part, to compress hydrocarbon process gas produced in the furnace.

4,287,378

CONVERSION OF OLEFINIC COMPOUNDS

Filippo Pennella, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 954,723, Oct. 25, 1978, abandoned.

This application Feb. 11, 1980, Ser. No. 120,223

Int. Cl.[3] C07C *6/00*

U.S. Cl. 585—643 45 Claims

1. In a process for the redistribution of at least one olefinic bond of at least one reactant olefinic organic compound which comprises reacting said at least one reactant olefinic organic compound in the presence of a solid catalyst comprising a compound selected from the group consisting of transition metal oxides, transition metal compounds convertible to oxides by calcination and mixtures thereof deposited on an essentially inert solid support, at a temperature, at a pressure and for a time sufficient to effect said redistribution of at least one olefinic bond, the improvement comprising; exposing said solid catalyst to electromagnetic radiation having a wavelength of at least about 1000 A in the presence of at least one olefinic organic compound selected from the group consisting of at least one reactant olefinic organic compound, at least one olefinic organic compound other than a reactant olefinic organic compound and mixtures thereof, said exposing of said solid catalyst to electromagnetic radiation being carried out prior to said reacting of said at least one reactant olefinic organic compound, during said reacting of said at least one reactant olefinic organic compound or both prior to and during said reacting of said at least one reactant olefinic organic compound.

2. A process in accordance with claim 1 wherein the process comprises converting at least one reactant olefinic organic compound, having at least 3 carbon atoms per molecule, to at least one product olefinic organic compound having a larger number of carbon atoms per molecule than said reactant olefinic organic compound and at least one product olefinic organic compound having a smaller number of carbon atoms per molecule than said at least one reactant olefinic organic compound.

36. In a process for the isomerization of at least one reactant olefinic organic compound including reacting said at least one reactant olefinic organic compound with a catalyst active for the isomerization of said at least one reactant olefinic organic compound at a temperature, at a pressure and for a time sufficient to effect said isomerization of said at least one reactant olefinic organic compound, the improvement comprising; exposing said catalyst to electromagnetic radiation having a wavelength of at least about 1000 A in the presence of at least one olefinic organic compound selected from the group consisting of at least one reactant olefinic organic compound, at least one olefinic organic compound other than a reactant olefinic organic compound, said exposing of said catalyst to electromagnetic radiation being carried out prior to said react-

ing of said at least one olefinic organic compound, during said reacting of said at least one reactant olefinic organic compound or both prior to and during said reacting of said at least one reactant olefinic organic compound.

4,287,379

PROCESS FOR OBTAINING ISOBUTENE FROM C_4-HYDROCARBON MIXTURES CONTAINING ISOBUTENE

Erwin Brunner; Eckart Schubert, both of Ludwigshafen; Alfred Lindner, Bobenheim-Roxheim; Franz Merger; Klaus Volkamer, both of Frankenthal; Max Strohmeyer, Limburgerhof, and Gerhard Sandrock, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 116,554, Jan. 29, 1980, abandoned, which is a continuation of Ser. No. 1,294, Dec. 29, 1978, abandoned. This application Apr. 7, 1980, Ser. No. 137,750

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1978, 2802198

Int. Cl.[3] **C07C** *7/00*

U.S. Cl. 585—839 **12 Claims**

1. A process for obtaining isobutene from a C_4-hydrocarbon mixture containing isobutene, which comprises

(a) reacting the mixture with a primary C_3- or C_4-alcohol in the presence of an ion exchanger in its acid form as a condensing agent to form the corresponding C_3- or C_4-alkyl tert-butyl ether by feeding the primary C_3- or C_4-alcohol and the C_4-hydrocarbon mixture, with or without prior mixing, to an etherification reaction zone which contains the ion exchanger;

(b) distilling the reaction mixture obtained from the etherification reaction zone in a first distillation zone, taking off as the top product without water washing a C_4-hydrocarbon mixture comprising the unconverted hydrocarbons and not more than 1,000 ppm by weight of the primary C_3- or C_4-alcohol and taking off as the bottom product the resulting C_3- or C_4-alkyl tert-butyl ether, which may contain therein primary C_3- or C_4-alcohol which may have been added in excess;

(c) feeding the bottom product to a second reaction zone, containing an acid catalyst, in which the C_3- or C_4-alkyl tert-butyl ether is decomposed at an elevated temperature to give isobutene and primary C_3- and C_4-alcohol;

(d) feeding the mixture of isobutene and primary C_3- and C_4-alcohol produced in step (c) to a second distillation zone, taking off as the top product without a water wash isobutene containing not more than 500 ppm by weight of primary C_3- or C_4-alcohol and taking off as the bottom product the remaining primary C_3- or C_4- alcohol produced in step (c);

and

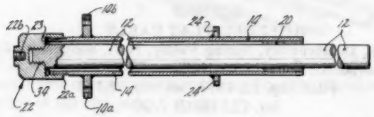
(e) Recycling the primary C_3- or C_4-alcohol which is the bottom product of step (d) to the etherification reaction zone.

4,287,380

ELECTRODE ASSEMBLY FOR MOLTEN GLASS FOREHEARTH

Richard E. Fairbanks, Manchester; James F. Stevenson, West Hartford, and John F. Blumenfeld, Simsbury, all of Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Sep. 18, 1979, Ser. No. 76,580
Int. Cl.³ C03B *5/02*
U.S. Cl. 13—6 **12 Claims**



1. An electrode assembly adapted to be mounted to the framework of a furnace forehearth, and to extend through a stepped aperture defined in the furnace sidewall below the normal level of the molten glass contained therein, said electrode assembly comprising

a tubular sleeve of inert high temperature nickel alloy steel material and having an outside diameter which is less than the diameter of the smaller portion of the stepped aperture in the furnace sidewall,

said sleeve having radially projecting flange means intermediate its ends which flange means is adapted to abut the stepped portion of the aperture in the furnace sidewall, said flange means including a gasket for abutting the shoulder of the stepped aperture in the furnace sidewall,

means for mounting said sleeve to the furnace framework so that the sleeve is clamped axially inwardly of the furnace sidewall aperture to thrust said flange means against the shoulder of the stepped aperture in the furnace sidewall,

an elongated electrode of readily oxidizable material positioned inside said sleeve and having an inner end projecting into the molten glass, said electrode having a diameter significantly less than the inside diameter of said sleeve,

a plug for connecting the outer end of said electrode to the outer end of said sleeve so that the electrode is oriented in spaced coaxial relationship inside said sleeve to define an annular space therebetween, and

non-metallic spacer means between the inner end of said sleeve and said electrode to support the electrode coaxially of said sleeve and to block the flow of molten glass into said annular space by reason of the glass hardening between said electrode said sleeve and said spacer means.

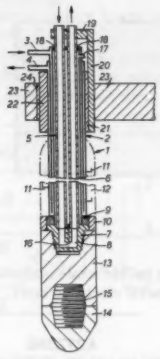
4,287,381

ELECTRIC ARC FURNACE ELECTRODES

Robert W. Montgomery, Sheffield, England, assignor to British Steel Corporation, London, England

Filed Nov. 27, 1979, Ser. No. 97,632
Claims priority, application United Kingdom, Dec. 19, 1978, 49022/78
Int. Cl.³ H05B *7/08*
U.S. Cl. 13—18 C **15 Claims**

1. An electrode for an arc furnace comprising a metal column including a pair of bus bars extending centrally through the column and a water cooled tubular structure surrounding and electrically insulated from the bus bars, said bus bars being connected to a conductive screw-threaded member at one end thereof, and a plurality of elongated dependent carbon or graphite sections, one of said sections being secured to the member, and that section, together with the other(s), being



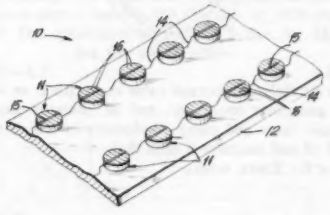
secured to one another through nipples having screw-threads of the same size as that of the said member.

4,287,382

SOLAR CELL ASSEMBLY AND FABRICATION OF SOLAR CELL PANELS UTILIZING SAME

Hollis E. French, North Chelmsford, Mass., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 9, 1980, Ser. No. 148,268
Int. Cl.³ H01L *31/04, 31/18*
U.S. Cl. 136—244 **5 Claims**



1. A solar cell assembly for use in forming a solar cell panel comprising: a sheet of non-woven, heat-actuatable sheet material selected from the group consisting of non-woven synthetic fibers having a thermally activated adhesive thereon and non-woven filaments of thermoplastic adhesive material, said sheet material having a major top surface; and a plurality of solar cells arrayed on and adhesively bonded to the top surface of the sheet material.

4,287,383

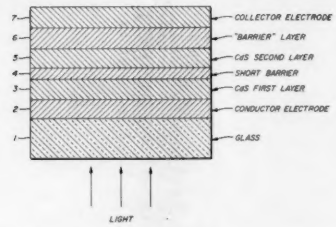
CADMIUM SULFIDE PHOTOVOLTAIC CELL OF IMPROVED EFFICIENCY

Terry M. Peterson, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 106,818, Dec. 26, 1979, abandoned. This application May 12, 1980, Ser. No. 148,892
Int. Cl.³ H01L *31/06, 31/18*
U.S. Cl. 136—260 **8 Claims**

1. A cadmium sulfide photovoltaic cell of improved efficiency comprising successive layers of a transparent conducting electrode layer, a first cadmium sulfide semi-conductor layer, a short-barrier layer comprising cadmium sulfide, said short-barrier layer containing a minor portion of a metal se-

lected from the group consisting of titanium aluminum, chromium, vanadium, boron, magnesium, beryllium and scandium,



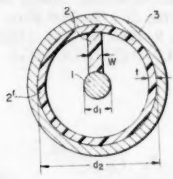
a second cadmium sulfide semi-conductor layer, a barrier layer and a collecting metal electrode layer.

4,287,384

PHASE STABILIZATION TYPE COAXIAL CABLE

Yasunori Saito, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 22, 1980, Ser. No. 114,173
Claims priority, application Japan, Feb. 23, 1979, 54/21003
Int. Cl.³ H01B *11/18*
U.S. Cl. 174—29 **4 Claims**



1. An air dielectric coaxial cable comprising: an inner conductor, and outer conductor, and an insulator disposed between said inner and outer conductors in which the space factor R of said insulator is such that:

$R_{min} < R < R_{max}$, where:

$$\frac{1}{R_{min}} = -(\epsilon_0 - 1) + \frac{\epsilon_0}{2} \frac{\frac{1}{\epsilon_0}\frac{\partial \epsilon_0}{\partial T} + \left(1 - \frac{1}{\epsilon_0}\right)\left[\alpha_0 - \alpha_1 \frac{1 + (\alpha_2/\alpha_1)(d_2/d_1)}{1 + (d_2/d_1)}\right]}{5 \times 10^{-6} - \alpha_1 \frac{1 + (\alpha_2/\alpha_1)(S_2E_2/S_1E_1)}{1 + (S_2E_2/S_1E_1)}}$$

and

$$\frac{1}{R_{max}} = -(\epsilon_0 - 1) - \frac{\epsilon_0}{2} \frac{\frac{1}{\epsilon_0}\frac{\partial \epsilon_0}{\partial T} + \left(1 - \frac{1}{\epsilon_0}\right)\left[\alpha_0 - \alpha_1 \frac{1 + (\alpha_2/\alpha_1)(d_2/d_1)}{1 + (d_2/d)}\right]}{5 \times 10^{-6} + \alpha_1 \frac{1 + (\alpha_2/\alpha_1)(S_2E_2/S_1E_1)}{1 + (S_2E_2/S_1E_1)}}$$

where:

S_1: the cross-sectional area of said inner conductor,

S_2: the cross-sectional area of said outer conductor,

E_1: the Young's modulus of a material forming said inner conductor,

E_2: the Young's modulus of a material forming said outer conductor,

α_0: the coefficient of linear expansion of the insulator material,

α_1: the coefficient of linear expansion of said material forming said inner conductor,

α_2: the coefficient of linear expansion of said material forming said outer conductor,

d_1: the outside diameter of said inner conductor,

d_2: the inside diameter of said outer conductor,

ϵ_0: the dielectric constant of said insulator,

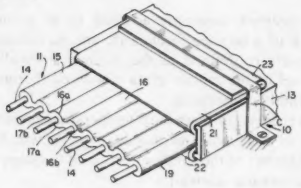
and T: the ambient temperature.

4,287,385

SHIELDED FLAT CABLE

Donald S. Dombrowsky, Spring Valley, N.Y., assignor to Carlisle Corporation, Buchanan, N.Y.

Filed Sep. 12, 1979, Ser. No. 75,154
Int. Cl.³ H01B *7/20*
U.S. Cl. 174—36 **4 Claims**



1. Shielded flat electric cable comprising:

(a) a cable core including;

(i) a plurality of conductors of indefinite length spaced apart and disposed in parallel and coplanar configuration,

(ii) a body of indefinite length of solid dielectric material having a pair of relatively wide parallel faces and a pair of relatively narrow, opposing edges joining said faces, said conductors being embedded lengthwise in said body and thereby retained in said spaced part, parallel and coplanar configuration insulated from each other and from the exterior of said cable core, and

(iii) means defining a plurality of parallel lands and a plurality of parallel grooves alternately disposed in each said face lengthwise thereof with said grooves aligned between adjacent conductor locations in said core and said lands aligned adjacent said conductors; and

(b) an electric shield assembly including

(i) a pair of flat spacer strips of indefinite length of solid dielectric material positioned, one butting against each said face and extending lengthwise thereof thereby trapping air-dielectric in said grooves between said lands and said spacer strip, and

(ii) a sheath of conductive metal enclosing said core and spacer strips, said sheath comprising a pair of thin conductive layers, one adhered to each said spacer strip on the surface thereof facing away from said cable core, and a pair of thin conductive channels, one positioned over each said edge of said body overlying the adjacent portions of said conductive layers on said spacer strips.

4,287,386

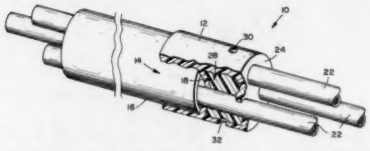
END SEAL FOR CONDUITS

Steven Scahill, 131 Bolinas Rd., Fairfax, Calif. 94930, and Gary M. Burrafato, 224 Humboldt Ave., San Rafael, Calif. 94901

Filed Jul. 27, 1979, Ser. No. 61,301
Int. Cl.³ H02G *15/00*
U.S. Cl. 174—76 **6 Claims**

1. A device for use in forming an end seal for an electrical conduit carrying at least one cable comprising, in integral construction, a cylindrical walled member having an opening at one end dimensioned to receive the conduit and terminating in a first partition having at least one aperture through which the cable may pass in a friction fit, a second partition parallel to

and spaced from said first partition and having at least one corresponding aperture through which the cable may pass in a friction fit, said first and second partition forming, together



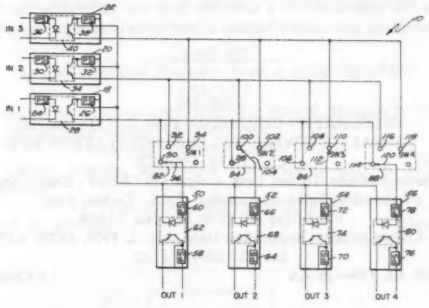
with the cylinder wall, a chamber, said chamber further having at least a first opening communicating from the chamber to the exterior of the end seal.

4,287,387

TELETYPEWRITER LOOP SWITCHING MATRIX

Robert R. Hartley, Niantic, and Joseph A. Konrad, New London, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 7, 1979, Ser. No. 101,292
Int. Cl.³ H04L *15/00*
U.S. Cl. 178—2 R **9 Claims**



1. A system for interconnecting and switching teletypewriter signals which comprises:

a first plurality of "IN" loops with each member thereof receiving the teletypewriter signals from a corresponding member of a plurality of sources of the teletypewriter signals;

a second plurality of "INTERNAL" loops with each member thereof having a first half interfaced with a corresponding member of said first plurality of "IN" loops; and

a third plurality of "OUT" loops with each member thereof connected to a plurality of receivers of the teletypewriter signals and each member thereof being interfaced with a second half of a corresponding member of said second plurality of "INTERNAL" loops.

4,287,388

DRIVE-IN THEATRE SOUND DISTRIBUTION SYSTEM

Walter R. Beer, and Margaret Beer, both c/o Grantville P.O., Bass Hwy., Grantville, Victoria, Australia (3984)

Filed Dec. 10, 1979, Ser. No. 101,518
Claims priority, application Australia, Dec. 19, 1978, PD7157
Int. Cl.³ H04R *27/00*
U.S. Cl. 179—1 DD **1 Claim**

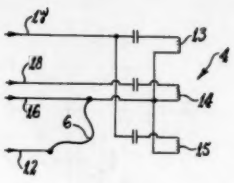
1. A drive-in theatre sound distribution system comprising:

means for converting the sound track of a film into an audio information signal;

means for transmitting said signal to at least one sound reproducing apparatus for use with a dual channel magnetic playback apparatus having two playback heads and a cassette or cartridge receiving aperture, said sound reproducing apparatus including:

a transducer having three transfer heads, two of which are connected in parallel;

alignment means comprising a blank cassette or cartridge for receiving said transfer heads and for maintaining the latter in spatial position relative to the blank cassette or cartridge, whereby said sound reproducing apparatus may be inserted into the receiving aperture with either of its sides uppermost or outermost of the playback apparatus to align one of said parallel connected transfer heads and the remaining transfer head opposite respective playback heads of the playback apparatus to function so that dual channel sound may be reproduced by the playback apparatus.

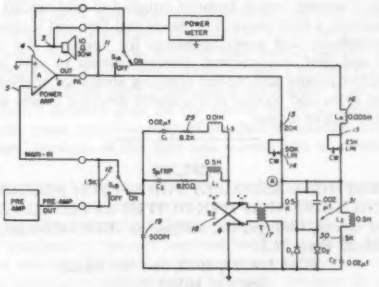


4,287,389

HIGH-FIDELITY SPEAKER SYSTEM

George W. Gamble, One Phlox La., Acton, Mass. 01720

Continuation-in-part of Ser. No. 955,534, Oct. 30, 1978, Pat. No. 4,229,618. This application May 31, 1979, Ser. No. 44,171
Int. Cl.³ H04R *3/00*
U.S. Cl. 179—1 F **3 Claims**



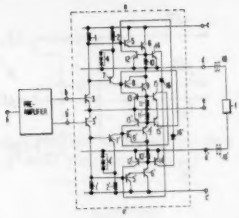
1. High-fidelity speaker system comprising in combination a moving-coil loudspeaker having a voice coil and a coil input terminal

an audio amplifier of high gain associated therewith, said audio amplifier having a signal input and a power output, a low resistance connecting said power output to said voice coil, an impedance network from said power output to said signal input, said impedance network including a dominating high resistance, said high resistance being between said power output and a junction point electrically near said signal input, and a leakage impedance between said junction point and said coil input terminal, said impedance network also including a non-linear element adapted to compensate for the non-linear properties of said loudspeaker.

4,287,390
POWER AMPLIFIER APPARATUS HAVING OVER-CURRENT PROTECTION FUNCTION

Hirokazu Fukaya, and Masashi Shoji, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 31, 1979, Ser. No. 44,136
Claims priority, application Japan, May 31, 1978, 53-66042
Int. Cl.[3] H03F *21/00, 3/18*
U.S. Cl. 179—1 A 13 Claims



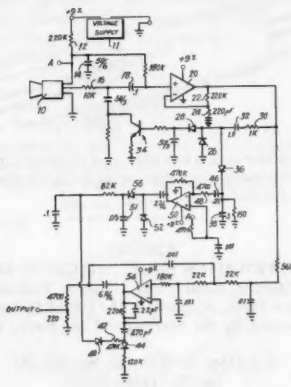
1. A power amplifier comprising a first series connection of collector-emitter paths of first and second output transistors connected between power supply terminals; first driving means for driving said first and second output transistors alternatively in response to a first input signal fed through a first input terminal; first over-current detector means provided for said first and second output transistors; first protective means for protecting said first and second output transistors in response to the output of said first over-current detector means; a first output terminal coupled to said first series connection; a second series connection of collector-emitter paths of third and fourth output transistors connected between said power supply terminals; second driving means for driving said third and fourth output transistors alternatively in response to a second input signal fed through a second input terminal, the phase of said first input signal being opposite to that of said second input signal; second over-current detector means provided for said third and fourth output transistors; second protective means for protecting said third and fourth output transistors in response to the output of said second over-current detector means; a second output terminal coupled to said second series connection; a load coupled between said first and second output terminals; first applying means for applying the output from said first over-current detector means to said second protective means; and second applying means for applying the output from said second over-current detector means to said first protective means.

4,287,391
MICROPHONE ASSEMBLY FOR SPEECH RECORDING USING NOISE-ADAPTIVE OUTPUT LEVEL CONTROL

Daniel Queen, Chicago, Ill., assignor to RHR Industries, Ltd., Cliffside Park, N.J.

Filed Jun. 21, 1979, Ser. No. 50,623
Int. Cl.[3] H04R *27/00*
U.S. Cl. 179—1 P 12 Claims

1. A microphone assembly for recording speech characterized by a speech burst rate, with a noise-adaptive automatic output level control for an associated tape recorder having automatic gain control means, said microphone assembly comprising: transducing means for transducing an electrical audio signal with minimal distortion of directional characteristics; input amplifier means connected to said transducing means and including an output; means coupled to said transducing means and to said input amplifier means for attenuating the fundamental and first formant of said signal; automatic gain control means connected to the output of said input amplifier means; output amplifier means connected to the output of said input amplifier means and to said automatic gain control amplifier means and including controllable high-frequency bandwidth limitation means; and speech-noise differentiating means connected to said automatic gain control amplifier means and detecting presence of said speech burst rate with the fundamental and first formant attenuated to derive a control voltage representing percentage of speech, said control voltage being

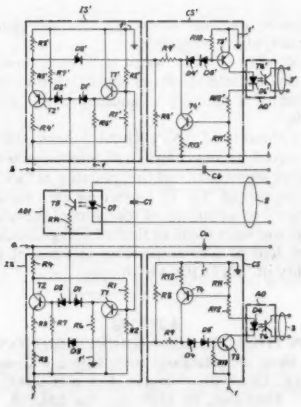


applied as control inputs to both the automatic gain control amplifier means and the bandwidth limitation means resulting in the generation of a constant level for processing by the automatic gain control means of said associated tape recorder.

4,287,392
INTEGRATED CIRCUITRY FOR EXCHANGING SIGNALS BETWEEN TELEPHONE STATION AND CENTRAL OFFICE

Flavio Melindo, Torino, Italy, assignor to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Torino, Italy

Filed May 30, 1979, Ser. No. 43,848
Claims priority, application Italy, Jun. 2, 1978, 68269 A/78
Int. Cl.[3] H04M *3/22*
U.S. Cl. 179—16 AA 9 Claims



1. In a telephone system including a subscriber station connected to a central office via a line loop with two talking conductors provided with respective blocking capacitors, and signal-transmitting means extending between switching equipment to said central office and points of said talking conductors lying between said blocking capacitors and said subscriber station,

the improvement wherein said signal-transmitting means comprises:

two signal-detecting networks constituted by sets of first integrated-circuit compounds including two semiconductor elements connected between respective talking conductors of said line loop and respective terminals of a direct-current source, said semiconductor elements being provided with a common biasing circuit including resistance means connected across said source in series with a light-responsive device;

a common capacitor connected between said signal-detecting networks for compensating voice-frequency currents propagating in opposite directions over said talking conductors;

two threshold comparators constituted by sets of second integrated-circuit components respectively connected to said signal-detecting networks for translating voltage changes of predetermined minimum magnitudes occurring on said talking conductors into incoming d-c signals detectable by said switching equipment;

a light-emitting device juxtaposed with said light-responsive device and controlled by said switching equipment for translating outgoing d-c signals into conductivity changes of said semiconductor elements resulting in voltage changes on said talking conductors detectable at said subscriber station; and

individual coupler circuits respectively inserted between said threshold comparators and said switching equipment for transmitting said incoming d-c signals to the latter.

4,287,393

TRANSMISSION BRIDGE FOR A SUBSCRIBER'S CIRCUIT

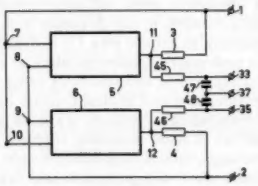
Antonius H. J. Reuvekamp, Blantyre, Malawi, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 20, 1979, Ser. No. 77,470

Claims priority, application Netherlands, Oct. 6, 1978, 7810086

Int. Cl.³ H04M *19/08, 3/18*

U.S. Cl. 179—70 **8 Claims**



1. A transmission bridge for a subscriber's circuit comprising:

two input terminals for the connection to a subscriber's line,

two supply resistors each connected on one side to a respective one of said input terminals,

a supply source which is coupled in a polarity independent manner to the opposite sides of each of said supply resistors, and

two identical alternating current circuits each connected to a respective one of said input terminals and supply resistors and having complimentary output stages, said alternating current circuits having a high input impedance and a low output impedance and whose output signal is substantially identical to the input signal at the associated input terminal, a first input of each alternating current circuit being connected to the respective associated input terminal, and the output of each alternating current circuit being connected to said opposite side of said associated supply resistor which is not connected to the associated input terminal side.

4,287,394

KEYBOARD SWITCH ASSEMBLY WITH PRINTED CIRCUIT BOARD

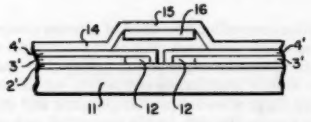
Tibor Hargita, Munich; Ingo Berlitz, Putzbrunn, and Herbert Hafner, Höhenkirchen, all of Fed. Rep. of Germany, assignors to Wilhelm Ruf KG, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 802,104, May 31, 1977, abandoned. This application Jan. 25, 1979, Ser. No. 6,697

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 7624175

Int. Cl.³ H01H *13/70;* **H05K** *1/00;* **G11C** *11/00*

U.S. Cl. 200—5 A **8 Claims**



1. A circuit board comprising a substrate of insulating material; an insulating varnish coating applied to at least one side of the substrate; a first set of nonintersecting conductive lines on each varnish coating; a coating of insulating varnish on and around the conductive lines only in the vicinity of desired intersections; a second set of nonintersecting conductive lines which have at least one portion of at least one line thereof superimposed over a portion of at least one other line of the first set of lines and separated therefrom by the insulating varnish coating; a plurality of groups of electrically conducting switch contact pads, wherein each switch contact pad is associated with a particular conductor line; a plurality of actuatable pushbuttons each cooperating electrically with one of the switch contact pads on the circuit board to electrically connect same; and a coating of conductive varnish over the exposed portions of the first and second sets of conductive lines.

5. A circuit board according to claim **1** wherein the pushbuttons comprise an elastic mat disposed upon the circuit board and including integral pushbutton shaped elements and electrically conducting contacts disposed inside the pushbutton elements and in alignment above one group of switch contact pads, wherein each contact is moveable towards its corresponding group of switch contact pads on the circuit board to electrically connect same.

4,287,395

TIMER WITH REVERSIBLE MOTOR

Ernest N. Martin, 1027 E. 5th Ave., Escondido, Calif. 92025

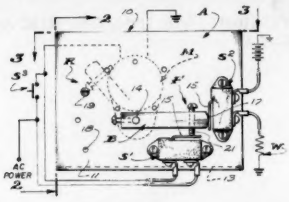
Filed Apr. 13, 1979, Ser. No. 29,621

Int. Cl.³ H01H *43/00*

U.S. Cl. 200—33 R **6 Claims**

1. A timer means comprising reversible repulsion inductive, shaded pole non-directional synchronous clock motor with a drive shaft and connected with an alternating current power supply, an elongate operating arm with an inner end secured to the drive shaft and projecting radially therefrom, a normally closed clock motor control switch controlling the flow of

current between the motor and the power supply and arranged in fixed radial spaced relationship from the shaft and engaged and opened by the arm when said arm is in a normal rotative position to de-energize the motor, stop means spaced circumferentially from the control switch to stop turning of the arm by the motor in a direction away from the control switch when the arm reaches a predetermined rotated position and to cause the motor to reverse and rotate in the opposite direction amd move the arm back to said normal position, a service switch in



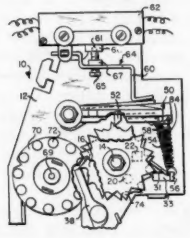
a power line controlling operation of a means controlled by the timer means and positioned relative to the control switch, stop means and arm to be engaged and operated by the arm when said arm is in a predetermined position within its travel between said control switch and stop means and starter means including a normally open switch connected with and between said alternating current power supply and said motor to selectively energize the motor and initiate turning of the arm away from said normal position and out of engagement with the control switch.

4,287,396

CONTROL DEVICE FOR A COIN OPERATED MECHANISM

Harry Greenwald, Whitestone, N.Y., assignor to Greenwald Electro-Mechanical Consultants, Inc., Whitestone, N.Y.

Filed Jan. 16, 1980, Ser. No. 112,461
Int. Cl.³ G07F *15/12*
U.S. Cl. 200—35 R **6 Claims**



1. In a control device for a coin operated mechanism wherein the device includes a ratchet wheel engaged with a ratchet follower, the ratchet wheel being disposed for rotation to displace the ratchet follower to open and close a switch and operate the mechanism, a stepping pawl operable to rotate the ratchet wheel and displace the ratchet follower to close the switch, and a star wheel operatively driven by a timing mechanism into engagement with the ratchet wheel when the switch is in its closed state to rotate the ratchet wheel and displace the ratchet follower to open the switch, wherein the improvement comprises:

(a) said ratchet wheel having a plurality of teeth each having a front and a back face defining a tooth apex therebetween, each said front face including a ratchet follower step, the back face of each tooth and the front face of the next adjacent tooth defining a well therebetween;

(b) said switch being a normally open type switch and being so disposed as to be moved to its closed state by the displacement of said ratchet follower into engagement with the step on one of said ratchet wheel teeth, and to move to its normally open state when said ratchet follower is disposed in one of said wells between adjacent teeth;

(c) said ratchet wheel being disposed, at the end of each stepping operation, to move said ratchet follower into engagement with one of said steps to move said switch to its closed state at the end of each stepping operation; and

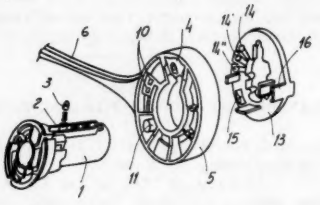
(d) said ratchet follower being displaced out of engagement with the step on a front face of one of said teeth, upon conjoint rotation of said star wheel and said ratchet wheel, to ride up said front face and over said apex and drop down the back face of said tooth wherein said follower is received within the next adjacent well thereby to open said switch.

4,287,397

DIRECTIONAL SIGNALING MECHANISM FOR AUTOMOTIVE VEHICLES

Giuseppe Codrino, Via Stazione, 2, 15028 Quattordio (Alessandria), Italy

Filed Apr. 30, 1979, Ser. No. 34,478
Claims priority, application Italy, May 3, 1978, 22970 A/78
Int. Cl.³ H01H *3/16*
U.S. Cl. 200—61.27 **5 Claims**



5. In a direction signaling apparatus for a vehicle and having a set of fixed switching contacts disposed for electrically connective cooperation with a set of movable switching contacts carried on a supporting body rotatably movable by a lever, said body being movable in one direction from a neutral position, corresponding to vehicle travel in a straight-ahead direction, to a first limit position, corresponding to vehicle travel in a full right turn direction, and said body being movable in the opposite direction from said neutral position to a second limit position, corresponding to vehicle travel in a full left turn direction, said set of fixed switching contacts and said set of movable switching contacts establishing a right turn indication circuit condition when said body is in said first limit position and establishing a left turn indication circuit condition when said body is in said second limit position, and establishing a non-turn indication circuit condition when said body is in said neutral position; signal cancelation means responsive to the movement of a steering member of the vehicle to return said body to its neutral position when said body is in one of said first and second limit positions and the steering member executes a rotary movement in a direction corresponding to a vehicle turn opposite to the turn indication associated with such limit position, and such rotary movement executed is greater than a predetermined response threshold amplitude, the improvement which comprises in combination: said set of fixed switching contacts and said set of movable switching contacts being of angular extension and positioned in relation to one another such that a respective right turn, left turn indication circuit condition can be established by a corresponding limited rotation of said body by an amount less than the rotation required to move the body from its neutral position to one of said first and second limit positions, and said signal cancelation means has a response threshold greater than the magnitude of such limited rotation whereby said body can be given such limited rotation in a selected direction to establish a corresponding

turn indication circuit condition and the body will not be returned to its neutral position to cancel such circuit condition.

4,287,398

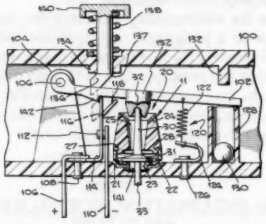
INERTIA SWITCHES

Avraham Ziv, Sepulveda; Akira Tanaka, Northridge; William Hollowell, Pacific Palisades; William J. Sieber, Northridge, and Munir J. Ahad, Newhall, all of Calif., assignors to American Safety Equipment Corporation, San Fernando, Calif.

Filed Jul. 3[illegible] 1979, Ser. No. 61,695

Int. Cl.[3] H01H *35/14*

U.S. Cl. 200—61.45 R **24 Claims**



1. An inertia switch having a switch body, comprising:

(a) inertia sensing pendulum means, mounted to said body, for detecting momentum changes of said body said pendulum means comprising:

(1) a generally hollow and cylindrical tiltable mass;

(2) actuator shaft means, passing centrally through said tiltable mass and moveable linearly upward relative to said mass; and

(3) cam means, disposed within said pendulum means, for moving said shaft means linearly upward when a change in momentum of said switch body causes movement of said mass relative to said shaft means;

(b) electrical switch means including a pair of resilient elements establishing an electrical contact, attached to said body and contacting said shaft means, for resettably interrupting said electrical contact upon said upward movement of said shaft means; and

(c) electrical contact biasing means, disposed between said body and said contact means, for preventing said shaft means from interrupting said electrical contact unless said change in momentum exceeds a predetermined level.

4,287,399

SWITCH DEVICE FOR A RAIL-BOUND TRANSPORT CAR FORMED OF A TRAVELING CARRIAGE AND A TRANSPORT CONTAINER THAT CAN BE PLACED AND LOCKED ONTO THE TRAVELING CARRIAGE

Edelbert Wiechert, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 19, 1979, Ser. No. 76,854

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1978, 2841820

Int. Cl.[3] H01H *3/00*

U.S. Cl. 200—153 T **6 Claims**

1. In a switch monitored assembly including a wall **(1,13)** and a container **(24)** which can be put in place against said wall in an initial relatively loose condition, and which can also be locked in place, a switch device comprising:

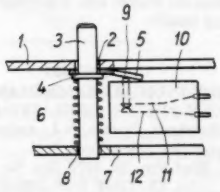
a pivotable two-arm lever **(5,15)** having a first arm movable from a first position to a second position in a first direction and having a leading surface with respect to said first direction of movement, said lever **(5,15)** having a second arm for effecting an actuating movement as said first arm moves from said first position to said second position,

a contact device **(10,23)** having an actuating element actuable in response to said actuating movement of said second arm,

a first spring **(6,21)**, a tappet **(3,17)** capable of axial excursion against the force of the first spring **(6,21)**, said tappet **(3,17)** having a projection **(4,20)** for pressing against the leading surface of said first arm for holding said first arm in said first position, the improvement comprising:

(a) said tappet **(3,17)** projecting from said wall **(1,13)** for engagement with said container and being responsive to the application of the container to the wall **(1,13)** in the initial relatively loose condition to effect an initial travel over an initial distance thereby to release said lever **(5,15)** for movement from said first position to said second position,

(b) a second spring acting on said lever to urge said first arm toward said second position but having insufficient force to overcome the action of the first spring **(6,21)**,



said lever upon initial travel of said tappet over said initial distance being pivoted under the influence of said second spring to move said first arm to said second position,

(c) stop means **(1** or **14)** engageable with said lever **(5,15)** in the second position of said first arm and preventing further pivotal movement of the lever under the impetus of said second spring as said tappet **(3,17)** is moved beyond said initial distance, and

(d) said tappet **(3,17)** being movable over a substantial distance beyond said initial distance as the container is locked in place relative to said wall **(1,13)**, said projection **(4,20)** moving away from said leading surface of said first arm during the further travel of said tappet beyond said initial travel and said tappet **(3,17)** being decoupled from the lever **(5,15)** during the travel of said tappet beyond said initial travel as the container is locked in place relative to said wall **(1,13)**.

4,287,400

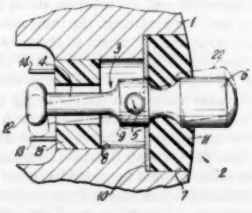
WATER-RESISTANT ROCKER SWITCH

Walter Kitik, Wolcott; Rodney Reder, Waterbury, and Stanley Kurpiewski, Newington, all of Conn., assignors to Timex Corporation, Waterbury, Conn.

Filed Nov. 1, 1979, Ser. No. 90,203

Int. Cl.[3] H01H *9/04*

U.S. Cl. 200—302 **4 Claims**



1. An improved water resistant rocker switch comprising:

a water-resistant conductive case member defining a bore therethrough, said bore comprising a larger diameter section toward the outside of the case member and a small diameter section toward the inside of the case member,

a rocker arm disposed in said bore having an actuating handle extending on the outside of the case and a contact stem portion extending toward the inside of the case,

electrically conductive support means electrically connected with the case member and pivotably supporting the rocker arm in the bore, said support means comprising a pivot pin on the rocker arm having its ends supported in grooves in said smaller diameter section of the bore,

an adhesive elastomer filling a portion of the bore between and adhered to the rocker arm and the case member and adapted to provide spring action while sealing and to allow pivoting movement of the arm, and

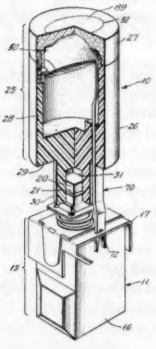
at least one contact terminal insulated from the case member and spaced from the contact stem portion in its normal position and positioned to be contacted by said stem portion when the rocker arm is pivoted by actuation of the actuating handle.

4,287,401

MODE-INDICATING MECHANISMS FOR PUSH-BUTTON OPERATED DEVICES

William R. Rohrbach, Towaco, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Nov. 16, 1979, Ser. No. 95,113
Int. Cl.³ G09F *9/00*; H01H *9/00*
U.S. Cl. 200—308 **16 Claims**



1. In combination with a mode-indicating mechanism for a two-position, push-button operated device of the type having a reciprocable operating plunger linearly movable by the push button from an outer position to an inner position and back, the push button including a housing mounted to the plunger for operating the plunger and having an open outer end; an end cap fastened to the open end of the housing and having a transparent viewing area through which an operator can inspect interior portions of the housing adjacent to the viewing area; a mechanical indicator mounted in the housing for linear movement therewith and for rotation about an axis transverse to the line of button movement, the indicator having a curved outer surface positioned adjacent to the viewing area that can be rotated past the viewing area to either of two stable positions I and II, depending on the mode of operation of the device, said outer curved surface having portions that are differently colored or otherwise marked such that the operator can determine at a glance the mode of operation of the device by looking into the viewing window; and linkage means, connected to the indicator and operated by linear movement of the button, for rotating the indicator from position I to position II, and back, in response to movement of the button, the improvement wherein the linkage means comprises:

(a) an elongated connector arm mounted in the housing generally parallel to the line of movement of the button and along an axis spaced from the axis of rotation of the indicator so that an inner segment of the arm is positioned within the housing and an outer segment of the arm projects outwardly from the housing, the inner segment of the arm being resiliently bendable compared to the outer segment;

(b) a fixed base member externally located with respect to the button and adjacent thereto;

(c) means for fixedly securing the outer segment of the arm to the base member so that the outer segment is fixed against movement with the button, the housing having a guideway for slideably receiving an intermediate portion of the arm so that the housing can reciprocate in and out with respect to the arm; and

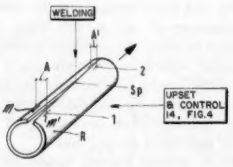
(d) means for mechanically attaching the inner segment of the arm to a peripheral region of the indicator radially offset from the axis of rotation, so that linear movement of the button and indicator therewith with respect to the arm causes the inner segment of the arm to flex and to operate as a resilient crank arm for rotating the indicator from position I to position II, and vice versa.

4,287,402

CONTROLLING UPSETTING DURING WELDING OF A SPLIT TUBE

Erhard Hentzschel, Solingen; Erhard Jaspert, Düsseldorf, and Kurt Niederhoff, Ratingen-Lintorf, all of Fed. Rep. of Germany, assignors to Mannesmann AG., Düsseldorf, Fed. Rep. of Germany

Filed Jun. 7, 1979, Ser. No. 46,380
Int. Cl.³ B23K *31/06*
U.S. Cl. 219—61.5 **4 Claims**



1. Method of controlling upsetting pressure during resistance welding of adjoining edges of a split tube having been made from strip or skelp, comprising the steps of

providing markings to both sides of a gap between the not yet welded edges upstream from the welding;

determining the width of the gap in the plane of marking;

measuring the distance between the markings downstream from the welding; and

controlling upsetting by maintaining said distance between prescribed limits.

4,287,403

METHOD AND APPARATUS FOR ADJUSTING THE GAP IN AN ELECTRIC DISCHARGE MACHINE

Kunihiko Sato, Owari-Asahi; Tetsuro Urata, Nagoya; Mitsugi Kawano; Terumasa Jinba, both of Fukuyama; Yukio Kato, Kasugai, and Takeo Uebayashi, Fukuyama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Nippon Kokan Kabushiki Kaisha, both of Tokyo, Japan

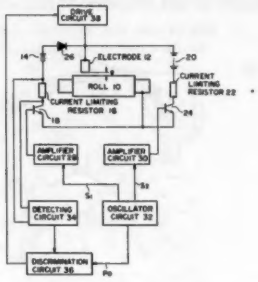
Filed Jul. 31, 1978, Ser. No. 929,438
Claims priority, application Japan, Aug. 1, 1977, 52-92378
Int. Cl.³ B23P *1/02*
U.S. Cl. 219—69 M **7 Claims**

1. In an electric discharge machining method comprising defining a working gap between an electrode and a work piece, controlling the feed of said electrode to adjust said working gap and moving said electrode and a work part of said work

piece relative to each other thereby giving a satin finish to a surface of said work piece, the improvement comprising the steps of:

applying across said working gap, repeatedly and consecutively, a series of voltage pulse trains, each voltage pulse train consisting of a plurality of high voltage pulses followed by a single low voltage pulse;

detecting in response to the application of said low voltage



pulse a working current across said working gap, comparing the working current for discrimination with a reference value corresponding to a predetermined interelectrode condition, and controlling the feeding of said electrode in accordance with the compared working current and reference value to adjust said working gap; and

applying said high voltage pulses for a predetermined time to cause discharge and give a satin finish to the surface of said work piece by electric discharge machining.

4,287,404

ELECTRODE FOR ELECTRICAL DISCHARGE MACHINING

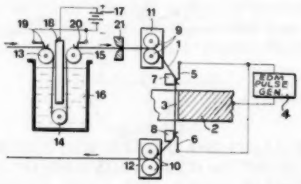
Danielle Convers, Geneva; Francois Balleys, Vernier, and Jean Pfau, Geneva, all of Switzerland, assignors to Ateliers des Charmilles, S.A., Geneva, Switzerland

Filed Feb. 26, 1979, Ser. No. 14,927

Claims priority, application Switzerland, Mar. 3, 1978, 2317/78; May 5, 1978, 4872/78

Int. Cl.³ B23P 1/12

U.S. Cl. 219—69 W **14 Claims**



1. In combination with an EDM apparatus, a filament electrode for electrical discharge machining of a workpiece wherein said filament electrode is displaced longitudinally and laterally through the workpiece, said filament electrode comprising a core made of material having a relatively high mechanical strength and a relatively thin metallic surface coating on said core, said metallic surface coating comprising at least 50% of a metal having a low temperature of vaporization selected from the group consisting of zinc, cadmium, tin, lead, antimony, bismuth and an alloy thereof.

4,287,405

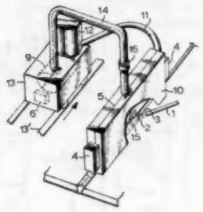
PROCESS AND APPARATUS FOR EXHAUSTING FUMES PRODUCED BY ARC WELDING

Takashi Ohmae; Yasuhiro Fukaya; Yasuyuki Yoshida; Tamotu Oka; Masahiko Sato, all of Hiroshima, and Masazumi Nagareda, Saka, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1979, Ser. No. 81,260

Int. Cl.³ B23K 9/32

U.S. Cl. 219—136 **10 Claims**



1. A process for exhausting weld fumes, wherein during arc welding, optical radiation emitted from an arc is detected by photelectric means provided on a suction hood, said suction hood is made to travel along a weld line in response to an electric detection signal from said photelectric means which is related to an intensity of illumination of said optical radiation at said suction hood so that said hood may be maintained within a predetermined range of travel, and thereby the weld fumes are exhausted through said suction hood while said suction hood is always covering a weld metal zone.

4,287,406

ELECTRIC CONTACT DEVICE WITH FLUIDIZED METAL PARTICLE BED

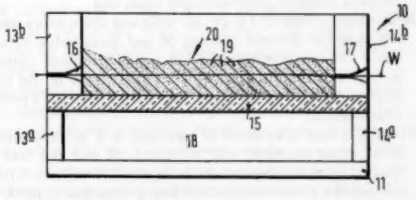
Evan J. Davies, Sutton Coldfield, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 939,401, Sep. 5, 1978, abandoned. This application Mar. 10, 1980, Ser. No. 128,648

Claims priority, application United Kingdom, Sep. 8, 1977, 37481/77

Int. Cl.³ C21D 9/62

U.S. Cl. 219—155 **8 Claims**

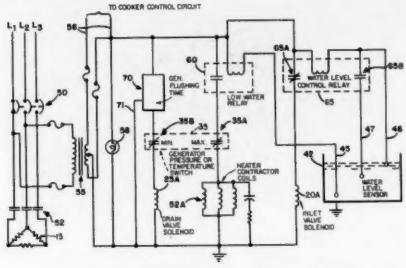


1. An electric contact device, for conveying electric current to an article, comprising a container, a bed of uniformly distributed electrically conductive de-oxidised metal particles in said container, means to fluidize said particles with a non-oxidizing gas, means to provide a non-oxidising environment for said bed of particles, a current feeder member adapted to contact said bed, and means for maintaining a part of the article, spaced from the current for maintaining a part of the article, spaced from the current feeder member, in contact with said bed of particles when fluidized.

4,287,407
TANK FLUSHING DELAY ARRANGEMENT FOR A STEAM GENERATOR

Fritz F. Treiber, Centerville, and Dallas A. Margraf, Spring Valley, both of Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed Aug. 17, 1978, Ser. No. 934,532
Int. Cl.[3] H05B *1/02;* **F22B** *1/28, 37/50*
U.S. Cl. 219—273 **7 Claims**



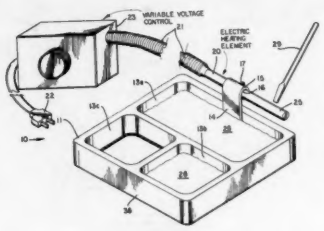
1. In a steam generator adapted for intermittent operation,
a tank having a water inlet, a steam outlet, and a drain,
a heater associated with said tank to heat water therein to the vaporization temperature,
a power operated inlet valve controlling said water inlet,
a power operated normally closed drain valve controlling said drain,
a water level sensor connected to said tank,
means for sensing the pressure of steam in said tank;
the improvement comprising
a control circuit connected to said valves, said heater, said sensing means, and said water level sensor,
said control circuit including
means for opening said inlet valve in response to a low water level sensed by the water level sensor,
means for opening said drain valve for a predetermined time period upon starting said generator to drain water from said tank and for automatically closing said drain valve after expiration of the predetermined period to initiate filling of said tank, said inlet valve being opened in response to a low water level sensed by the water level sensor during said perdetermined period to flush the tank with fresh water,
means energizing said heater and inlet valve under control of said water level sensor and said pressure sensing means to maintain water level in said tank within predetermined limits as steam is generated and used, and
delay means connected in circuit with said drain valve opening means to prevent opening of said drain valve by said drain valve opening means for a predetermined cooling period sufficient to condense residual steam in the tank after said generator has been turned off following a period of operation,
whereby water is retained in said tank at a predetermined level when the generator is turned off and the tank is flushed upon starting only if the generator has been turned off and the predetermined cooling period has elapsed.

4,287,408
COMBINATION ELECTRICALLY HEATED MATERIAL RECEPTACLE AND INSTRUMENT HEATER

Melvin Wilson, 16 Lanier Dr., Cumming, Ga. 30130

Filed Mar. 10, 1980, Ser. No. 128,509
Int. Cl.[3] H05B *1/00, 3/68;* **F27B** *14/06*
U.S. Cl. 219—475 **4 Claims**

1. A materials heating device comprising:
a receptacle formed of thermoconductive material;
heating means mounted in good heat conducting relationship to said receptacle so as to impart heat to said receptacle and to material received therein;
said heating means being separate from said receptacle and including a portion which is exposed to direct contact by an implement, so that said implement can receive heat from said heating means;
said heating device further comprising conductive connecting means for connecting said heating element to said receptacle and for conducting heat from said heating element to said receptacle to heat said receptacle;

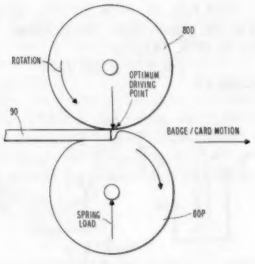


said heating means comprising an elongated heating element, and wherein said connecting means comprises a bracket attached to said receptacle and forming an annular holder which surrounds and holds said elongated heating element in good heat transfer relation thereto and in spaced relationship to said receptacle, said annular holder being shorter in length than said elongated heating element whereby a portion of said elongated heating element is exposed beyond said annular holder for easy contact and access by said implement.

4,287,409
READER WITH SPECIAL MEANS FOR TRANSPORTING CARDS AND BADGES OF VARIABLE THICKNESSES

Richard J. Auchinleck, Norristown, Pa., assignor to Peripheral Dynamics, Inc., Norristown, Pa.

Filed Feb. 12, 1979, Ser. No. 11,197
Int. Cl.[3] G06K *13/00;* **B65H** *5/02*
U.S. Cl. 235—475 **8 Claims**



7. In a reader for reading badges or cards of widths within a range of 0.048 inch, a transport drive mechanism comprising a plurality or roller pairs, each roller pair having a drive roller mounted on a fixed shaft and having a durometer of at least 70, a pinch roller normally in contact with said drive roller and movable relative to said drive roller, said pinch roller having a durometer which is at least twice as low as said drive roller durometer, and biasing means for biasing said pinch roller toward said drive roller, whereby a card or badge which is introduced to the nip of each of said roller pairs penetrates said pinch rollers sufficiently to be grabbed and transported by said roller pairs, whereupon said pinch rollers are forced to move

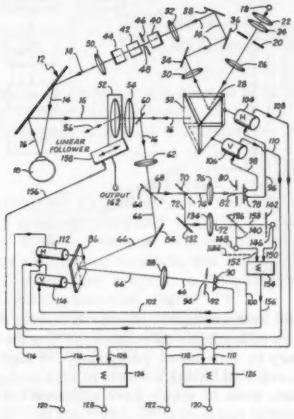
against said biasing means sufficiently to accommodate said card or badge between the two rollers of each of said pairs.

4,287,410

DOUBLE PURKINJE EYE TRACKER

Hewitt D. Crane, Portola Valley, and Carroll M. Steele, Los Altos, both of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Feb. 28, 1979, Ser. No. 15,929
Int. Cl.³ A61B *3/10*; H01J *40/14*
U.S. Cl. 250—201 **26 Claims**



1. In an improved eye tracker for continuously tracking orientation of an optic axis of an eye having a cornea and a lens, where the eye is adapted to move axially, to translate in a horizontal and a vertical direction and to rotate in a horizontal and a vertical direction, comprising light source means for forming a light beam, optical means for directing said light beam into the eye whereby light reflected by the cornea forms a first Purkinje image and light reflected by the rear of the eye lens forms a fourth Purkinje image, optical means to focus the image of at least one of the said first and fourth Purkinje images nominally at a given reference focal distance, first and second light flux density measuring devices that produce an output electrical signal which is a function of light incident thereon, and means to obtain light flux density on the said first and second light flux density measuring devices from equal distances but opposite sides of the said reference focal distance.

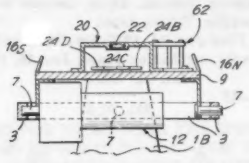
4,287,411

APPARATUS FOR SEEKING AND FOLLOWING A LUMINOUS ZONE, SUCH AS THE SUN

Marcello Beucci, Arezzo, Italy, assignor to Gori & Zucchi S.p.A., Italy

Filed Jun. 19, 1979, Ser. No. 50,115
Claims priority, application Italy, Sep. 1, 1978, 9576 A/78
Int. Cl.³ G01J *1/20*
U.S. Cl. 250—203 R **5 Claims**

1. Apparatus for seeking a luminous zone, comprising an angularly movable element, photoelectric transducer means, mounted to said movable element, for generating signals for orientating the element towards the luminous zone, said transducer means comprising at least two first transducers facing in different directions and symmetrically disposed about a plane containing the axis of angular movement of the element, said first transducers having excitation surfaces inclined toward said plane, and servomotor means for moving the element



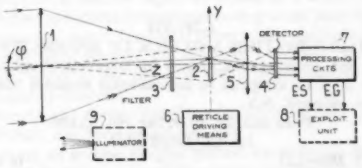
about said axis, said servomotor means being controlled by the signals generated by the transducers.

4,287,412

PHOTOELECTRIC DIRECTION FINDER

Georges Couderc; Yves Cojan, and Denis Bargues, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 20, 1979, Ser. No. 96,112
Claims priority, application France, Nov. 24, 1978, 78 33289
Int. Cl.³ G01J *1/20*
U.S. Cl. 250—203 R **10 Claims**



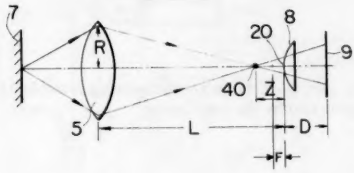
1. A photoelectric direction finder system for the detection and the location of a light radiating target, of the type comprising an optical reception and focussing objective, a revolving disk rotated in the focal plane of the objective and provided with reticles formed from transparent and opaque zones for producing a modulation whose frequency is linked with the rotation speed, an optical filter, a photodetector device for the modulated radiation and circuits for the processing and deviation measurement of the detected signals, comprising demodulating circuits and producing deviation signals which are representative of the angular offsetting of the target relative to a reference axis, and in which an intermediate deviation measurement objective is positioned between the reticles and the detector, the latter being of the four quadrant type for producing the deviation signals from the respective signals of the quadrants and consecutively separating the deviation measurement function from the modulating and spatial filtering function produced by the reticles, wherein the reticles are determined transparent to the radiation produced by an auxiliairy laser illuminator modulated with a modulation which is separate from that produced by the reticles and wherein it comprises additional processing circuits for processing the detected laser signals, as well as circuits for switching and selecting passive and semi-active operating modes for delivering the corresponding deviation measurement data.

4,287,413

AUTOMATIC FOCUS SERVOMECHANISM IN OPTICAL INFORMATION READING DEVICE

Hitoshi Kanamaru, Saitama, Japan, assignor to Universal Pioneer Corporation, Tokyo, Japan

Filed Jun. 14, 1979, Ser. No. 48,421
Claims priority, application Japan, Jun. 16, 1978, 53-73524
Int. Cl.[3] G01J *1/36*
U.S. Cl. 369—45 8 Claims



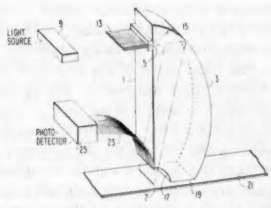
1. In a focus servo apparatus in which an information recording surface of a recording medium is illuminated with light from an illumination source and information recorded on the recording surface is read out by using light reflected from the recording surface, the improvement comprising; a condenser lens for condensing the light from the recording surface, a cylindrical lens for passing the condensed light, light receiving means having a light receiving surface positioned for receiving the light from said cylindrical lens, a distance D between said cylindrical lens and said light receiving means being larger than the focus distance F of said cylindrical lens, and means responsive to an output of said light receiving means moving said condenser lens for condensing the illumination light onto the recording surface of said recording medium.

4,287,414

ILLUMINATION AND PICK UP APPARATUS

Suk S. Soo, Ossining, and Andrew M. Schwartz, Poughkeepsie, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 29, 1979, Ser. No. 53,680
Int. Cl.[3] G02B *5/14*
U.S. Cl. 250—227 16 Claims



1. Apparatus for focusing source radiation on a surface and receiving radiation which is reflected from said surface, comprising:

unitary reflecting means having at least one reflecting surface for reflecting source radiation from an input focal line to an output focal line to form an illuminating slit image at said output focal line,

alignment means forming part of said unitary reflecting means abutting said surface for aligning said reflecting means to maintain said output focal line and the associated slit image focused on said surface, and,

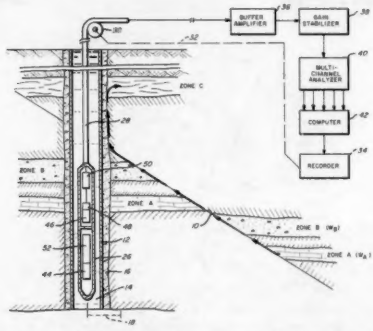
light receiving means mounted in fixed positional relationship to said reflecting means and spaced from said surface when said alignment means aligns said reflecting means, for receiving light which is reflected from said surface.

4,287,415

MEASUREMENT OF FLOWING WATER SALINITY WITHIN OR BEHIND WELLBORE CASING

Dan M. Arnold, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Mar. 3, 1980, Ser. No. 126,754
Int. Cl.[3] G01V *5/00*
U.S. Cl. 250—270 10 Claims



1. A method of determining the salinity of a fluid flowing within or behind a casing in a well borehole so that the source of such water may be determined, comprising the steps of:

(a) locating a well tool having a source of high energy neutrons, at least some of which have sufficient energy to cause the nuclear reactions $O^{16}(n,p)N^{16}$ and $Na^{23}(n,\alpha)F^{20}$, and a gamma ray detector longitudinally spaced from the source at, at a position in the well borehole;

(b) irradiating the borehole environs with high energy neutrons from the source;

(c) detecting gamma rays caused by the decay of the unstable isotopes nitrogen-16 and flourine-20 and generating signals respresentative thereof;

(d) obtaining from the detected gamma rays a measure of the relative presence of oxygen and sodium in the fluid in the vicinity of the detector; and

(e) obtaining from the measure of relative presence of oxygen and sodium an indication of the salinity of the fluid.

4,287,416

METHOD OF DETERMINING FATIGUE AND STRESS CORROSION DAMAGE

Irvin R. Kramer, Baltimore, Md.; Sigmund Weissman, Metuchen, N.J., and Robert N. Pangborn, State College, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

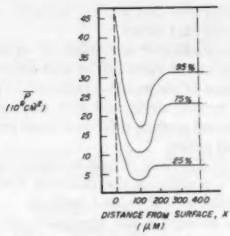
Filed Mar. 28, 1980, Ser. No. 135,065
Int. Cl.[3] G01N *23/20*
U.S. Cl. 250—273 6 Claims

6. A method of determining the stress-corrosion damage to a structural member comprising the steps of:

making an x-ray diffraction line intensity profile of the member to a depth of about 10 micrometers, said x-ray diffraction line intensity profile providing a measure of the critical excess dislocation density of the member at stress-corrosion failure thereof; and

making a second x-ray diffraction line intensity profile of the member from the surface to beyond the work hardened surface layer, which may extend to a depth of about 200 micrometers, said second profile being determined from x-ray diffraction patterns from sufficient depths to provide an average excess dislocation density of a desired accuracy wherein the x-ray diffraction line intensity profile of

this step provides a measure of the average excess dislocation density of the member and wherein the ratio of the average excess dislocation density of the member of this



step to the critical excess dislocation density of the member at failure is equivalent to the amount of stress-corrosion damage which has occurred to the member.

4,287,417

METHOD OF DETERMINING THE DETERIORATION OF HEAT-RESISTANT FERRITIC STEEL PARTS

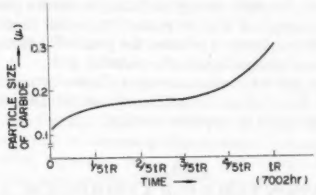
Shuichi Komatsu; Shinichi Nakamura, both of Yokohama; Kazumi Shimotori, Kawasaki, and Yoshio Nakayama, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 28, 1980, Ser. No. 115,884

Claims priority, application Japan, Jan. 31, 1979, 54-9122; Aug. 31, 1979, 54-110303

Int. Cl.³ G01N *23/00*

U.S. Cl. 250—307 **3 Claims**



1. A method of determining the degree of deterioration of a Cr-Mo-V ferritic steel part applied in a region of hi temperature which comprises the steps of:

measuring the value of at least one of the crystallization factors of vanadium carbide, V_4C_3, crystallized out in the Cr-Mo-V ferritic steel part applied in a region of high temperature, wherein said crystallization factors of vanadium carbide are particle size, interparticle distance, percentage volume or crystallization density, and wherein said crystallization density, and wherein said crystallization factors are measured from the structural image of said crystallized V_4C_3 produced by the dark view field process of an electronic microscope;

applying a previously obtained referential deterioration curve showing the relationship between the length of time for which the Cr-Mo-V steel is applied under test-accelerating conditions and said at elast one of the crystallization factors of vanadium carbide to determine the length of time under test-accelerating conditions necessary to produce the measured value of said at least one crystallization factor of vanadium carbide; and

calculating the length of time for the steel part to be used under practical operating conditions from the length of time for which the steel is applied under test accelerating conditions to achieve the value shown by said at least one crystallization factor by applying the Larson-Miller parameter

$P = T(\log t + 20)$

wherein

P=a constant,

T=absolute temperature, and

t=time.

4,287,418

METHOD FOR MEASURING THE SPECTRAL DISTRIBUTION OF ELECTROMAGNETIC RADIATION INTENSITY AND SPECTROMETER OF MILLIMETRIC AND FAR-INFRARED RANGES FOR EFFECTING SAME

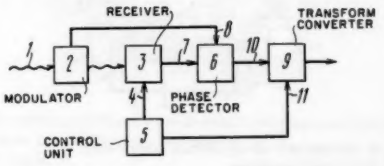
Jury Y. Divin, ulitsa Narodnogo Opolchenia, 54, kv. 100; Oleg J. Polyansky, ulitsa Malaya Gruzinskaya, 46, kv. 10, and Alexandr Y. Shulman, ulitsa Dubninskaya, 12, korpus 3, kv. 96, all of Moscow, U.S.S.R.

Filed Jun. 27, 1979, Ser. No. 52,688

Claims priority, application U.S.S.R., Jul. 6, 1978, 2639129; Jul. 6, 1978, 2639130

Int. Cl.³ G01J *1/00*

U.S. Cl. 250—336 **9 Claims**



1. A method for measuring the spectral distribution of electromagnetic radiation, comprising the following steps:

converting the spectral distribution of electromagnetic radiation to an electric signal by means of a direct integral Hilbert transform in superconducting weak links, by making use of an a.c. Josephson effect in said superconducting weak links, wherein the instrinsic Josephson generation line width is less than the value corresponding to the required resolution,

measuring the electric signal as a function of a direct integral Hilbert transform parameter; and

applying an inverse integral Hilbert transform to the measured function to determine the desired spectral distribution of said electromagnetic radiation.

4,287,419

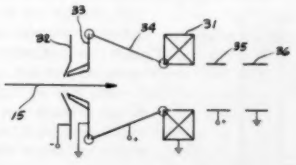
STRONG FOCUS SPACE CHARGE

Rex Booth, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 22, 1978, Ser. No. 908,030

Int. Cl.³ G21K *1/00*

U.S. Cl. 250—396 ML **10 Claims**



1. A strong-focus space-charge lens for focusing charged-particle beams passing therethrough comprising: at least one current-carrying coil for creating a magnetic field, and a plurality of spaced charged electrodes positioned in spaced axial

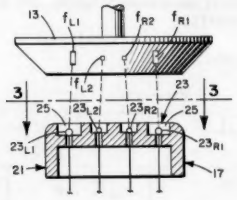
alignment with respect to said current-carrying coil for creating at least one electric field, said electric field being at substantially right angles to said magnetic field to form cross magnetic and electric fields to focus charged-particle beams; said plurality of spaced charged electrodes having an axial length greater than an axial length of said current-carrying coil; said coil and electrodes being constructed such that a charged-particle beam passing therethrough is focused thereby.

4,287,420

STEREOSCOPIC X-RAY DEVICE

Toshio Yamamura, and Takeshi Muraki, both of Yokohama, Japan, assignors to Toshiba Corporation, Kawasaki, Japan

Filed Oct. 2, 1979, Ser. No. 81,127
Claims priority, application Japan, Nov. 2, 1978, 53-134460
Int. Cl.³ H05G *1/00, 1/30*
U.S. Cl. 250—402 **9 Claims**



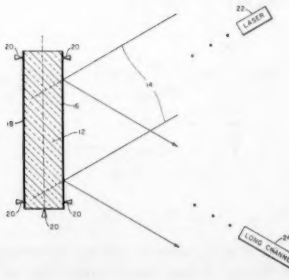
1. A stereoscopic X-ray device comprising:
an evacuated envelope;
a target within said envelope; and
electron beam means within said envelope for directing electron beams on said target to form at least two pairs of focal spots on said target to generate X-rays, said pairs of focal spots being spaced apart on said target, said electron beam means including first and second filament means, said first filament means having a size larger than said second filament means for forming a first pair of focal spots having a larger size than a second pair of focal spots, said second pair of focal spots being formed by said second filament means and positioned between said first pair of focal spots on said target.

4,287,421

COMPENSATION OF THERMAL EXPANSION IN MIRRORS FOR HIGH POWER RADIATION BEAMS

Paul G. DeBaryshe, Lincoln, and Sheldon L. Glickler, Natick, both of Mass., assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Jun. 7, 1978, Ser. No. 913,317
Int. Cl.³ G02B *5/08;* **H01J** *27/00*
U.S. Cl. 250—423 P **13 Claims**



1. A multilayer front reflecting mirror for reflecting electromagnetic radiation provided in a beam from a source of radiation and with the mirror compensated for thermal expansion caused by absorption of incident radiation, said mirror comprising:
a substrate transmissive to the electromagnetic radiation in said beam and having first and second surfaces with said first surface receiving said beam;
a coating on said first surface of said substrate operative to reflect the majority of the radiation in said output beam, absorb a small portion of the incident radiation to produce a thermal change in size along said first surface and to transmit to said second surface a further small portion of the radiation in said beam;
a coating on said second surface of said substrate operating to absorb at least a portion of the radiation transmitted from said first surface to said second surface;
to produce a thermal change in size along said second surface compensatory to the change in size along said first surface.

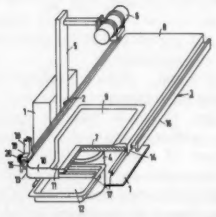
11. A photoexcitation system comprising:
an optically transmissive substrate having first and second surfaces;
a source of radiant energy in the optical frequency range to which said substrate is transmissive and providing an output beam or radiation of said radiant energy;
said output beam being directed toward said first surface;
a coating on said first surface of said substrate operative to reflect the majority of the radiant energy in said output beam to absorb a small portion of the incident radiation to produce a thermal change in size along said first surface and to transmit to said second surface a small portion of the radiant energy in said output beam;
a coating on said second surface of said substrate operating to absorb a portion of the radiant energy transmitted from said first surface to said second surface to produce a thermal change in size along said second surface compensatory to the change is size along said first surface;
said source of radiant energy including means for providing radiant energy of one or more frequencies in which at least one frequency is selected for producing isotopically selective photoexcitation of a material; and
means responsive to radiant energy reflected by said coating on said first surface for producing isotopically selective photoexcitation in response thereto.

4,287,422

EXAMINATION TABLE FOR A UROLOGICAL X-RAY EXAMINATION APPARATUS

Wilko Kuphal, Rueckersdorf, and Heinz Wons, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 7, 1978, Ser. No. 967,320
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1977, 2759079
Int. Cl.³ G01N *21/00;* **A61G** *13/00*
U.S. Cl. 250—439 R **8 Claims**



1. An examination table for a urological X-ray examination apparatus comprising a patient support platform capable of shadow-free irradiation, resting on a frame, comprising two

longitudinally extending support rails for the mounting of accessories, and comprising means for collecting contrast medium flowing out, characterized in that there is mounted on the patient support platform (7) a single-piece, smooth, support plate (8) with support rails (15, 16) attached to the longitudinal sides (13, 14), said support plate consisting of readily disinfectible material, completely covering the upper surface and the four lateral edges of the patient support platform adjoining the upper surface.

4,287,423

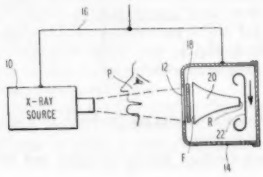
PANORAMIC DENTAL RADIOGRAPHY IMAGE INTENSIFICATION EMPLOYING MINIFICATION TECHNIQUES

Robert H. Cushman, Princeton, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Nov. 9, 1979, Ser. No. 92,883

Int. Cl.[3] **G01N** *23/00;* **G01T** *1/00*

U.S. Cl. 250—439 P **2 Claims**



1. An x-ray machine comprising an x-ray source adapted to continuously direct x-radiation through a slot provided in a front panel of a camera assembly containing film controllably movable therewithin for exposing selected portions thereof to x-radiation passing through a patient disposed between said x-ray source and camera assembly to form images of said patient on said film, said x-ray source and said camera assembly orbiting as a unit about head of said patient, said machine comprising intensifying means mounted within said camera assembly immediately after said slot to receive all x-radiations passing therethrough for conversion thereof into light images, said intensifying means comprising a single stationary intensifying screen, input face and output face of said intensifying screen being substantially identical in size with said slot, minifying means mounted within said camera assembly after said intensifying means for receiving said light images from said intensifying means for reducing said light images in size into minified images having increased intensity, said minifying means comprising a fiber optic minifying lens having input face greater in area than its output face, said lens input face having dimensions substantially identical with said input and output faces of said intensifying screen, said input face of said lens being mounted in very close operable proximity to said output face of said intensifying screen, said lens output face having dimensions to provide a ratio of lens input face to lens output face of about 14 to 1, and wherein light intensity of said image leaving said output face of said minification lens has a light intensity at least 10 fold greater than light intensity of image leaving said intensifying screen, and

wherein optical density of a radiographic image of dental enamel obtained through said minification lens which provides a light intensity at its output face at least 10 fold greater than light intensity of image leaving said intensifying screen represents about a 7 to 1 optical density increase when exposure time is set at about 0.3 seconds using an x-ray power supply of about 90 kVp and filtration equivalent to 2.5 mm of aluminum, and said optical density of said radiographic image of said dental enamel is about 0.3, and

wherein said 7 to 1 optical density increase represents a potential of about 10 to 1 dose reduction.

4,287,424

SCANNING DEVICE FOR USE IN AXIAL TRANSVERSE TOMOGRAPHIC APPARATUS

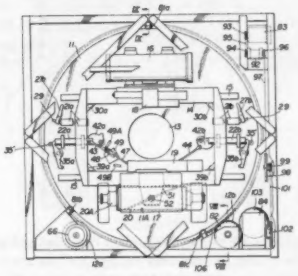
Chuji Tomita; Hiroshi Abe, and Katashi Shimazu, all of Kashiwa, Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

Filed Nov. 21, 1979, Ser. No. 96,430

Claims priority, application Japan, Nov. 24, 1978, 53-160676[U]

Int. Cl.[3] **G03B** *41/16;* **G01N** *21/00*

U.S. Cl. 250—445 T **4 Claims**



1. A scanning device for use in axial transverse tomographic apparatus, comprising, in combination:

a pedestal;

a rotary member rotatably supported on said pedestal;

means provided in said rotary member in the vicinity of center of rotation thereof for accommodating a subject for examination;

a support mounted on said rotary member for linear movement and supporting an X-ray source and its associated detector which are disposed on opposite sides of said accommodating means to face each other;

drive means for causing reciprocating movements of the support at a plurality of different speeds and for causing the rotary member to rotate through a certain angle at a time for each movement of the support in any one direction;

a plurality of damping means arranged on said rotary member so as to assume positions to work upon the support when said drive means causes the support to move at a plurality of different speeds, and having substantially great repelling forces enough to brake and accelerate this support at each changing of direction of movement thereof where said damping means comprises

a first damper including a cylinder mounted on the rotary member, a member mounted on the rotary member at an end of said cylinder, a slide fit in said cylinder, and a coil spring provided between this slide and said member and being arranged on the rotary member to insure that the slide is moved at any changing of direction of movement of the support, and

a second damper including a cylinder mounted on the rotary member, two slides fit in this cylinder, and a coil spring inserted between these two slides, and being arranged on said rotary member to insure that one of these two slides is moved at any changing of direction of movement of said support; and

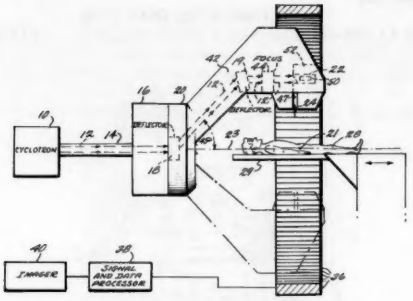
change-over means for selectively rendering a part of said damping means to a state of working upon the support and to an inoperative state for the support in accordance with the speed of movement of this support where said change-over means acts to allow free movement of the other one of said two slides of the second damper and also to lock this other slide in accordance with a speed of movement of the support.

4,287,425

CONSTRUCTION OF A CT SCANNER USING HEAVY IONS OR PROTONS

Donald O. Elliott, Jr., Baltimore, Md., assignor to Pfizer, Incorporated, New York, N.Y.

Filed Dec. 31, 1979, Ser. No. 108,831
Int. Cl.³ G01K *1/08*
U.S. Cl. 250—445 T **20 Claims**



1. An apparatus for obtaining a two dimensional display of the X-ray absorption distribution within a cross sectional volume of an object disposed along an axis, comprising

a target;

an X-ray detector spaced opposite said target; and

means for producing a substantially monochromatic X-ray beam extending from said target through said axis to said detector including means for angularly displacing said beam about said axis so as to scan said object in said cross-sectional volume;

said X-ray detector including means for converting said X-ray beam into a corresponding detected electrical signal;

said X-ray beam producing means including a source of high energy substantially monoenergetic ions focusable on said target; and

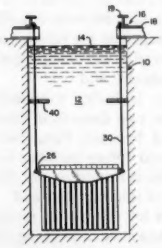
said target including atoms which are ionized by said high energy ions so as to emit substantially monochromatic X-rays.

4,287,426

NUCLEAR FUEL STORAGE APPARATUS FOR SEISMIC AREAS

Andrew J. Anthony, Tariffville, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 10, 1978, Ser. No. 950,103
Int. Cl.³ G21F *5/00*
U.S. Cl. 250—506 **9 Claims**



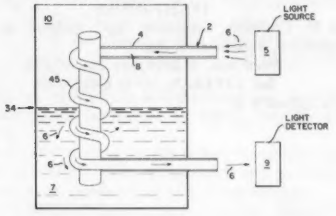
1. An earthquake resistant apparatus for storing nuclear fuel comprising: an earth connected pool formed of watertight material; water within said pool and below the normal water level of said pool; a structural grid for supporting fuel, located within said pool, in spaced relation from the sides thereof; a plurality of earth connected support members; and universally flexible tension members, substantially vertically oriented, attached at the lower end to said structural grid, and at the upper end to said support members.

4,287,427

LIQUID-LEVEL MONITOR

Donald R. Scifres, 1337 Montclair Way, Los Altos, Calif. 94022

Continuation of Ser. No. 842,968, Oct. 17, 1977, abandoned. This application Jan. 2, 1980, Ser. No. 109,070
Int. Cl.³ G01N *15/06*
U.S. Cl. 250—577 **10 Claims**



1. An apparatus for measuring the level of a liquid confined to a container comprising:

a light guiding medium having an input end and an output end,

means for launching a light wave into said input end of said light guiding medium,

said light guiding medium having at least a portion which, when immersed to a certain degree in said liquid transmits fractionally less of said light wave from said input end to said output end than when said portion is immersed to a lesser degree in said liquid,

said portion extending over a distance which is greater than the cross sectional thickness of said light guiding medium such that a range of liquid levels greater than said cross sectional thickness can be measured, and

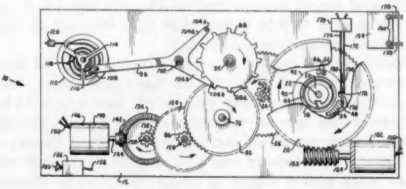
detector means positioned at the output end of said light guiding medium, said detector means measuring the intensity of said light wave which has traversed said light guiding means, said intensity being a function of the extent to which said portion of said light guiding means is immersed in said liquid.

4,287,428

AUTOMATIC SPRING POWERED BATTERY CHARGING DEVICE

James Smith, 2503 Prospect, Kansas City, Mo. 64127

Filed Jul. 27, 1979, Ser. No. 61,274
Int. Cl.³ H02J *7/00*
U.S. Cl. 290—1 E **6 Claims**



1. In a battery charging device of the type having a frame, a coil spring mounted on said frame for coiling and uncoiling movement, a drive gear mounted for rotation on said frame

and coupled with said coil spring in a manner to rotate in response to uncoiling of the spring, a mechanical linkage coupled with and driven by said drive gear upon rotation thereof, and battery charging means driven by said linkage and operable to apply charging current to the battery, a shaft supported for rotation on said frame and carrying said drive gear thereon, a spring winding gear mounted on said shaft for rotation relative thereto and coupled with said spring in a manner to effect winding thereof in response to rotation of the spring winding gear, power means for effecting rotation of said winding gear, the improvement comprising:

an actuator ring mounted on said shaft for movement independently thereof, said ring presenting a peripheral notch therein;

lost motion means coupling said drive gear and said actuator ring with one another in a manner providing lost motion therebetween;

a switch mechanism for energizing and deenergizing said power means, said switch mechanism including a switch arm having a free end engageable against the periphery of said actuator ring with said free end of the switch arm entering said notch upon movement of the actuator ring to a preselected rotative position corresponding to an unwound condition of said spring, said switch mechanism being operable to deenergize said power means when said free end is engaged against the periphery of said actuator ring and to energize said power means when said free end is disposed in said notch; and

means for removing said free end of the switch arm from said notch in response to rotation of said spring winding gear sufficient to effect a wound condition of the spring.

4,287,429

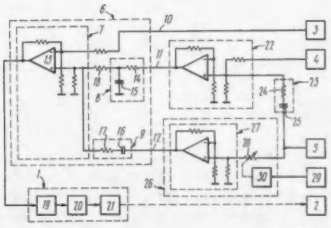
APPARATUS FOR AUTOMATICALLY CONTROLLING THE ACTIVE POWER PRODUCED BY THE GENERATOR OF A HYDRAULIC TURBINE-GENERATOR UNIT

Oleg I. Bashnin, prospekt Maiorova, 53, kv. 13; Vasily V. Semenov, Moskovsky prospekt, 171, kv. 92; Vasily N. Fedorov, Prazhskaya ulitsa, 23, kv. 61; Evgeny I. Rodionov, prospekt Raevskogo, 8, kv. 21; Boris A. Davidson, prospekt Lunacharskogo, 70, korpus 4, kv. 140, and Gleb S. Schegolev, Sinyavinskaya ulitsa, 12/49, kv. 29, all of Leningrad, U.S.S.R.

Filed Jul. 30, 1979, Ser. No. 62,034

Int. Cl.³ F01D *15/10;* **H02P** *9/04*

U.S. Cl. 290—40 C **5 Claims**



1. An apparatus for automatically controlling the active power produced by a generator of a unit including a generator and a hydraulic turbine having a gate for controlling water flow to the runner of the hydraulic turbine, said apparatus comprising:

means for providing a reference signal corresponding to a desired power level;

an active power measuring means to measure the power developed by said generator;

a gate opening sensing means responsive to the extent of opening of said gate;

a gate opening control means for adjusting the extent of opening of said gate;

a first summing means having two inputs and an output, a first of said inputs of said first summing means being coupled to said reference signal providing means, and said output of said first summing means being coupled to said gate opening control means;

a second summing means having two inputs and an output, a first of said inputs of said second summing means being coupled to said gate opening sensing means, and said output of said second summing means being coupled to the second of said inputs of said first summing means; and

an integrator having two inputs and an output, a first of said inputs and said output of said integrator being coupled, respectively, to said output and second of said inputs of said second summing means so as to form a negative feedback circuit comprising said second summing means, and the second of said inputs of said integrator being coupled to said active power measuring means.

4,287,430

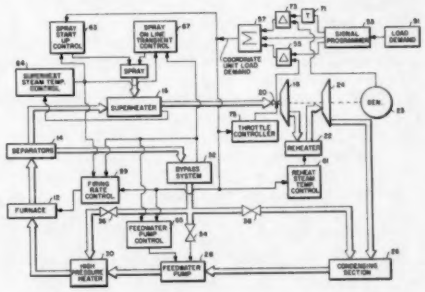
COORDINATED CONTROL SYSTEM FOR AN ELECTRIC POWER PLANT

Paul V. Guido, Cedar Grove, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jan. 18, 1980, Ser. No. 113,165

Int. Cl.³ F01K *13/02;* **F22D** *5/26;* **H02P** *9/04*

U.S. Cl. 290—40 C **3 Claims**



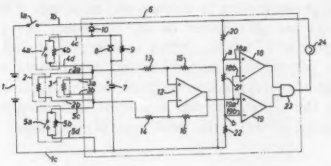
1. In a power plant having a steam turbine driving a generator, a furnace for generating steam to drive the turbine, separators to separate the water from the steam in the output of the furnace, a feedwater pump to pump water to said furnace, and a bypass system to collect the water separated out by said separators and recirculate the water to said furnace, said bypass system operating during start-up to a predetermined load set point and going out of service when the load rises above said predetermined set point; the improvement comprising: means to provide a load demand signal, means to provide a signal representing the pressure at the throttle valves of said steam turbine, control signal generating means operating to provide a signal varying in accordance with the difference between the pressure at said throttle valves and the pressure required at said throttle valves to provide the load represented by said load demand signal with the turbine valves at a predetermined start-up position, means responsive to said control signal to control the firing rate of said furnace in accordance with said control signal, and means responsive to said control signal to control said feedwater pump to pump water to said furnace at a rate corresponding to said control signal only after said bypass system is out of service.

4,287,431

ELECTRIC CONTROL CIRCUIT FOR SAFETY APPARATUS IN AUTOMOTIVE VEHICLES

Toshio Yasui, Obu, and Motoharu Naito, Okazaki, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 15, 1978, Ser. No. 942,816
Claims priority, application Japan, Sep. 20, 1977, 52-113477
Int. Cl.³ B60R *21/08*
U.S. Cl. 307—10 R **4 Claims**



1. In an electric control circuit for a safety apparatus of an automotive vehicle, which control circuit comprises a series connection of an electric power source, a plurality of normally open switch means to be closed in the occurrence of a vehicle collision, and electrically operated actuator means for actuating said safety apparatus upon closure of said switch means, said circuit further comprising a resistor connected in parallel with each of said switch means, said resistor having a predetermined resistance value defining an electric current applied to said actuator means through said resistor to normally maintain said actuator means inoperative,

the improvement comprising:

means in said series connection for directly joining each resistor and each of said switch means to said actuator means,

a differential amplifier connected to the opposite ends of said actuator means for directly amplifying a terminal voltage appearing between the opposite ends of said actuator means to generate an amplified voltage therefrom,

a constant voltage generator connected in series with said power source for generating a constant voltage therefrom,

a comparator for comparing the amplified voltage of said amplifier with the constant voltage to generate an output signal therefrom when the amplified voltage becomes lower or higher than the constant voltage, and

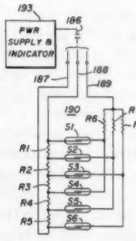
means for informing of malfunction of said control circuit in response to the output signal from said comparator.

4,287,432

VALVE POSITION DETECTING APPARATUS

Ezra Sensibar, Chicago, Ill., assignor to David Sensibar Irrevocable Trust, Chicago, Ill.

Filed Oct. 19, 1979, Ser. No. 86,461
Int. Cl.³ B63B *35/30*
U.S Cl. 307—116 **16 Claims**



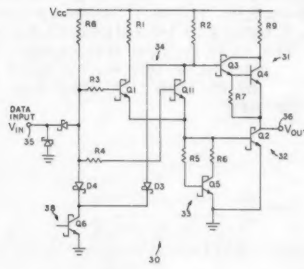
1. Position detecting apparatus for a hopper valve member which is movable between open and closed positions with respect to a hopper outlet at the bottom of a hopper in a hopper dredge vessel provided with power supply and indicator means, said detecting apparatus comprising an elongated transmitter tube disposed in the hopper and fixedly positioned with respect thereto, a plurality of sensing devices disposed in said tube and spaced apart longitudinally thereof respectively to correspond to predetermined positions of the valve member, said sensing devices being operable between two conditions and being adapted for coupling to the associated power supply and indicator means to provide signals indicative of the conditions of said sensing devices, an elongated protective sleeve fixedly secured to the valve member and movable therewith in surrounding telescopic relationship with said transmitter tube, said sleeve having a length sufficient to accommodate therein substantially the entire length of the transmitter tube, and actuator means carried by said sleeve for movement past said sensing devices sequentially to operate same as said sleeve moves with the valve member between the open and closed positions thereof thereby to detect and indicate the position of the valve member.

4,287,433

TRANSISTOR LOGIC TRISTATE OUTPUT WITH REDUCED POWER DISSIPATION

Steven N. Goodspeed, South Portland, Me., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Jan. 24, 1979, Ser. No. 5,929
Int. Cl.³ H03K *19/084, 19/088*
U.S. Cl. 307—473 **12 Claims**



1. In a transistor logic tristate output device of the type comprising an input and an output for binary data signals of high and low level potential, pullup element for sourcing current to the output from high potential, pulldown element for sinking current from the output to low potential, phase splitter element coupled at the input to control the pullup and pulldown elements, and an enable gate for sinking current from the elements of the device to afford a high impedance third state at the output when the enable gate is activated, the improvement comprising:

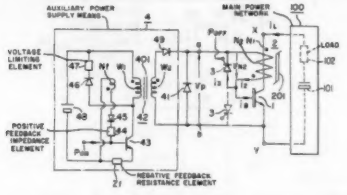
means defining a relatively high resistance path from high potential through the enable gate to low potential when the enable gate is activated thereby restricting power consumption in the high impedance third state;

said means defining a relatively low resistance path from high potential for current controlling the pulldown element without providing a route to low potential through said low resistance path when the enable gate is activated.

4,287,434
SEMICONDUCTOR SWITCH DEVICE

Masahiko Akamatsu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 850,269, Nov. 10, 1977, abandoned, which is a division of Ser. No. 704,491, Jul. 12, 1976, Pat. No. 4,087,703. This application Jul. 17, 1979, Ser. No. 58,329
Claims priority, application Japan, Aug. 28, 1975, 50/104311
Int. Cl.[3] H03K *17/60, 17/20, 17/06*
U.S. Cl. 307—253 **6 Claims**



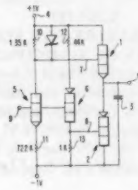
1. A semiconductor switch device comprising:
a power source;
a load;
a semiconductor switch serially disposed in a current path between the power source and the load, the semiconductor switch having a pair of main current electrodes and a control electrode, the semiconductor switch becoming conductive across the main current electrodes when a forward control current is applied to the control electrode;
a current transformer having a core, a primary conductor serially disposed in the current path and a secondary winding connected to the control electrode whereby a current responding to the current passed through the current path is supplied to the conrol electrode; and
an auxiliary power pulse supply means connected in series with the secondary winding of the current transformer for resetting the flux in the core of said transformer set by said primary conductor by applying a forward polarity pulse to the control electrode to turn on the semiconductor switch and thereby reverse the core flux, the auxiliary power pulse supply means comprising a second power source and a pulse supply switch which is controlled by a control signal to supply the forward polarity pulse through the secondary winding of the current transformer to the control electrode;
the forward polarity pulse being applied from said auxiliary power pulse souce means through said secondary winding to said control electrode whereby the forward control current is fed to said control electrode and magnetic flux of the core of said transformer is reset by the forward polarity pulse.

4,287,435
COMPLEMENTARY TRANSISTOR INVERTING EMITTER FOLLOWER CIRCUIT

Joseph R. Cavaliere, Hopewell Junction; Robert A. Henle, Clinton Corners; Richard R. Konian, Poughkeepsie, and James L. Walsh, Hyde Park, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 5, 1979, Ser. No. 82,254
Int. Cl.[3] H03K *17/60, 3/26*
U.S. Cl. 307—255 **6 Claims**

1. A complementary transistor, inverting emitter follower circuit comprising:
a series-connected first pair of bipolar complementary transistors,
the emitter electrodes of said first pair of transistors being connected together and to an output terminal,
a second pair of complementary bipolar transistors,
the collector electrodes of said second pair of transistors being directly connected to respective bases of said first pair of transistors of similar kind,
one of the remaining electrodes of said second pair of transistors being connected together,
at least one base of said second pair of transistors being connected to an input terminal, and

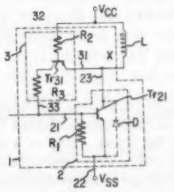


means connected to the collectors and emitters of said second pair of transistors and to the collectors of said first pair of transistors for biasing said first and second pairs of transistors.

4,287,436
ELECTRICAL CIRCUIT FOR DRIVING AN INDUCTIVE LOAD

Hideharu Tezuka, Yokosuka, and Yuuichiro Furukawa, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 18, 1979, Ser. No. 40,143
Claims priority, application Japan, Jun. 7, 1978, 53/68421
Int. Cl.[3] H03K *3/26;* **H01H** *47/00*
U.S. Cl. 307—270 **15 Claims**



1. An electrical circuit for driving an inductive load comprising:
a switching circuit having a first terminal to which an input signal is supplied, a second terminal connected to a power source, and a third terminal connected to another power source through the inductive load;
said third terminal connected to the second terminal when the input signal has one voltage potential and disconnected from the second terminal when the input signal has another voltage potential;
a detecting circuit having a first terminal connected to the third terminal of the switching circuit, a second terminal connected to said another power source and a third terminal connected to the first terminal of the switching circuit; and
said detecting circuit operable to switch said switching circuit to connect the second terminal of the switching circuit to the third terminal of the switching circuit in accordance with counter electromotive force induced between both ends of the inductive load when the third terminal of the switching circuit is disconnected from the second terminal of the switching circuit.

3. An electrical circuit for driving an inductive load, comprising:
an output transistor having a base, an emitter connected to a first power source, and a collector connected to a second power source through the inductive load; and

a detector transistor formed of a conductivity type opposite that of said output transistor and having an emitter connected to the collector of the output transistor, and a base connected to the second power source through a first resistor, and a collector connected to the base of the collector of the output transistor through a second resistor.

4,287,437

METHOD AND CIRCUITRY FOR EQUALIZING THE DIFFERING DELAYS OF SEMICONDUCTOR CHIPS

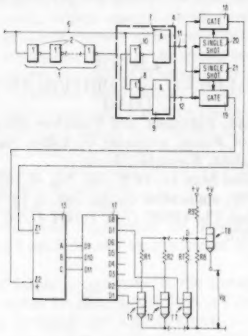
Rudolf Brosch, Sindelfingen; Helmut Schettler, Dettenhausen; Hans Schumacher, Schoenaich, and Rainer Zuehlke, Leonberg, all of Fed. Rep. of Germany, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Nov. 29, 1979, Ser. No. 98,439

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 2855724

Int. Cl.³ H03K *5/159*

U.S. Cl. 307—296 R **4 Claims**



1. The method of regulating the signal delay times of semiconductor chip circuits, characterized by the following steps:

(a) comparing the signal delay of a circuit of the semiconductor chip with a very precisely defined clock interval,

(b) altering the count of an up-down counter on the semiconductor chip in accordance with the comparison result in the one or in the other counting direction,

(c) decoding the count and altering the divider ratio of a voltage divider in accordance with said count, the tap of said voltage divider being connected to the base of an emitter follower providing at its emitter the supply voltage whose value influences the signal delay of the semiconductor chip circuits, and

(d) repeating process steps (a) to (c) until the difference Δt between the arrival of the delayed and of the subsequent undelayed clock pulse approaches zero.

4,287,438

FIELD EFFECT TRANSISTOR CURRENT SOURCE

David L. Cave, Phoenix, and Wilson D. Pace, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 925,083, Jul. 17, 1978, Pat. No. 4,207,537. This application Aug. 13, 1979, Ser. No. 66,129

Int. Cl.³ H03K *3/01, 3/26*

U.S. Cl. 307—297 **3 Claims**

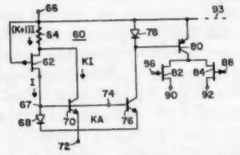
1. A current supply circuit including in combination:

current supply field effect transistor means having source, drain and gate electrodes;

negative feedback means having a selected resistance coupled between said source and gate electrodes;

bipolar diode means having one electrode connected to said drain electrode and another electrode connected to a supply terminal,

bipolar transistor means having a control electrode and main electrodes, said control electrode being coupled to said drain electrode and to said one electrode of said bipolar diode means at a circuit node, said main electrodes being connected between said source electrode and said supply terminal, said bipolar transistor means having an emitter-



to-base junction cross-sectional area which is greater than said anode-to-cathode junction area by a predetermined factor, said bipolar transistor means and said bipolar diode means enabling minimization of said selected resistance of said negative feedback means, said circuit node providing the output current of the current supply circuit; and

electrical load means connected to said circuit node.

4,287,439

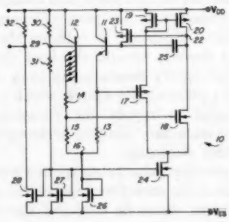
MOS BANDGAP REFERENCE

Horst Leuschner, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 30, 1979, Ser. No. 34,513

Int. Cl.³ H01L *31/00*

U.S. Cl. 307—310 **8 Claims**

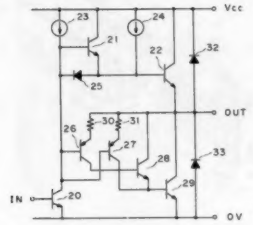


1. A bandgap reference circuit comprising: a first voltage potential terminal; a second voltage potential terminal; a first transistor having a base, a collector, and an emitter, the collector being coupled to the first voltage potential terminal; a second transistor having a base, a collector, and an emitter, the collector of the second transistor being coupled to the first voltage potential terminal, the emitter current density of the first transistor being larger than the emitter current density of the second transistor; a first resistor coupled between the emitter of the first transistor and the second voltage potential terminal; a second and a third resistor connected in series and forming a node therebetween, the second and third resistors being coupled in series between the emitter of the second transistor and the second voltage potential terminal; an amplifier having field effect transistors and also having a first and a second input and an output, the first input being coupled to the emitter of the first transistor, and the second input being coupled to the node between the second and third resistors, the output of the amplifier providing the bandgap reference voltage, and the output being coupled to the bases of the first and second transistors.

4,287,440
PROXIMITY SWITCHING DEVICE

Fumio Kamiya, Kyoto; Hisatoshi Nodera, Kusatsu; Kenji Ueda, Muko, and Hiroyuki Miyamoto, Kameoka, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Aug. 14, 1979, Ser. No. 66,405
Claims priority, application Japan, Aug. 31, 1978, 53-107141
Int. Cl.³ H03K *3/26*
U.S. Cl. 307—315 **4 Claims**

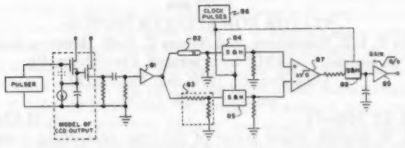


1. A proximity switching device, comprising:
an oscillating circuit including a detection coil,
a signal producing circuit for producing a detection signal in response to a change in the oscillation amplitude level of said oscillating circuit, and
an output for producing an output signal in response to said detection,
said output circuit comprising a pair of Darlington circuits and a driving transistor for driving said Darlington circuits,
wherein one of said Darlington circuits operates as a NPN transistor and the other operates as a PNP transistor, said Darlington circuits being connected complementary to provide complementary output signals, and
wherein one of said Darlington circuits is provided with a constant-current circuit which provides a constant base-biasing current to at least one of the transistors of the particular Darlington circuits.

4,287,441
CORRELATED DOUBLE SAMPLING CCD VIDEO PREPROCESSOR-AMPLIFIER

Edwyn D. Smith, Tucson, Ariz., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 30, 1979, Ser. No. 25,506
Int. Cl.³ G11C *27/02*
U.S. Cl. 307—353 **6 Claims**

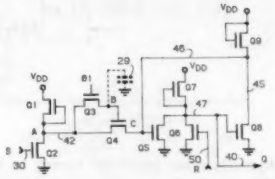


1. In combination with a charged couple device (CCD) having a periodic gated output a low level signal preprocessor comprising:
a source of clock pulses having a preselected sampling frequency;
a pair of sample-and-hold (S&H) circuits, each having a signal input, a clock input, an output and substantially equal signal gain characteristics, with their clock inputs coupled to and synchronized with said source and having their signal inputs each coupled to the output of the CCD;
a delay line means having a specific insertion loss and coupled in series with a first of said S&H circuits to delay the signal therein by a fraction of a cycle of said sampling frequency;
an attenuator means coupled in series with the second of said S&H circuits to attenuate the signal in said second S&H circuit by an amount equal to the insertion loss of said delay line means; and
a single output circuit coupled to the outputs of both of said S&H circuits.

4,287,442
EDGE SENSE LATCH

Brian M. Spinks, Austin, and John R. Dumas, Round Rock, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 26, 1979, Ser. No. 14,797
Int. Cl.³ H03K *5/153, 3/356*
U.S. Cl. 307—510 **10 Claims**



1. An MOS edge sense latch comprising:
a first MOS component responsive to an input signal having first and second states;
a second MOS component coupled to said first MOS component and responsive to a clock signal having first and second states, said second MOS component including capacitance means which is charged when said input signal and said clock signal are at their respective first and second states and a gate means, said gate means being conductive when said input signal and said clock signal are at said respective second and first states or when said capacitance means contains a predetermined level of charge; and
a latch circuit having an output terminal normally set to a first state and including third and fourth MOS components each having an input and an output, the input of said third MOS component being coupled to said gate means and to the output of said fourth MOS component, and the input of said fourth MOS component being coupled to said output terminal and to the output of said third MOS component, said output terminal being set to a second state only when said capacitance means contains said predetermined level of charge and said input signal changes to said second state.

4,287,443
LIQUID-METAL MAGNETOHYDRODYNAMIC CONVERTER

Ivan T. Aladiev, ulitsa Marshala Birjuzova, 43, kv. 21, Moscow, and Vazha A. Dzhamardzhashvili, ulitsa Juramishvili, 17, kv. 61, Tbilisi, both of U.S.S.R.

Filed Sep. 20, 1979, Ser. No. 77,313
Int. Cl.³ H02K *45/00*
U.S. Cl. 310—11 **4 Claims**

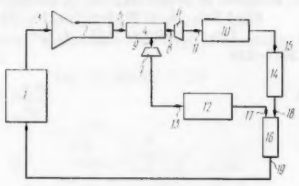
1. A liquid-metal magnetohydrodynamic converter comprising:
a heat source having an inlet and an outlet;
a two-phase nozzle having an inlet and an outlet and hydraulically connected via said inlet thereof to said outlet of said heat source;
a separator having a steam inlet, a first outlet and a second outlet and hydraulically connected via said steam inlet thereof to said outlet of said two-phase nozzle;

a liquid diffuser having an inlet and an outlet and hydraulically connected via said inlet thereof to said first outlet of said separator;

a steam diffuser having an inlet and an outlet and hydraulically connected via said input thereof to said second outlet of said separator;

a liquid metal cooler having an inlet and an outlet and hydraulically connected via said inlet thereof to said outlet of said liquid diffuser;

a condenser having an inlet and an outlet and hydraulically connected via said inlet thereof to said outlet of said steam diffuser;



a magnetohydrodynamic generator having an inlet and an outlet and hydraulically connected via said inlet thereof to said outlet of said liquid metal cooler;

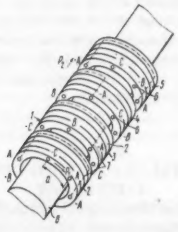
a means for heating and delivering liquid metal supplied from said cooler, having a first inlet, a second inlet and an outlet and hydraulically connected via said first inlet thereof to said oulet of said magnetohydrodynamic generator, via said second inlet thereof to said outlet of said condenser and via said outlet thereof to said inlet of said heat source.

4,287,444

CYLINDRICAL LINEAR INDUCTION MOTOR

Alexandr D. Popov, prospekt Koroleva, 12, kv. 154; Vladimir A. Solomin, ulitsa Dachnaya, 14, kv. 31; Nikolai R. Teptikov, ulitsa petrashevskogo, 48/23, kv. 57, and Jury D. Demchenko, ulitsa Verkhne-Nolnaya, 9, kv. 12, all of Rostov-na-Donu, U.S.S.R.

Filed Feb. 25, 1980, Ser. No. 123,958
Int. Cl.³ H02K *41/02*
U.S. Cl. 310—13 **4 Claims**



1. A cylindrical linear induction motor, comprising: an inductor;

a secondary element made of electrically conductive material and surrounded by said inductor;

a laminated core structure of said inductor;

cores of circular configuration forming said laminated core structure and having slots arranged on the internal surface of said cores;

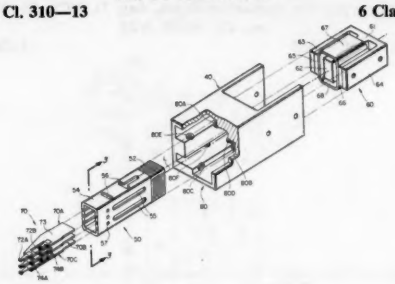
a polyphase winding of said inductor contained in said slots, the slots for like phases of adjacent ones of said cores being displaced by a distance equal to or greater than a distance between adjacent ones of said slots of one of said cores.

4,287,445

HIGH PERFORMANCE DISK DRIVE ACTUATOR

Mark H. Lienau, San Jose, Calif., assignor to Sperry Corporation, New York, N.Y.

Filed Apr. 21, 1980, Ser. No. 142,579
Int. Cl.³ H02K *41/02*
U.S. Cl. 310—13 **6 Claims**



1. An electromagnetic linear actuator comprising: a coil and cart assembly including a cart having a longitudinal axis and adapted at one end to support an element which is to be positioned along an axis parallel to the longitudinal axis, and a direct current coil mounted at the other end of said cart opposite the end adapted to support the element to be positioned, said coil having a longitudinal axis coincident with the longitudinal axis of the cart and having a cross section in a plane normal to its longitudinal axis which essentially matches the cross section of the end of said cart at which said coil is mounted, and said coil being mounted on said cart so that the center of gravity of the coil and the center of gravity of the cart are each on a line coincident with the cart longitudinal axis; an actuator housing including magnetic means having an air gap for receiving said coil and for passing magnetic flux through said coil normal to the surface of the windings thereof, whereby an electrical excitation in said coil results in movement of said coil and cart assembly along the cart longitudinal axis in a direction dependent upon the polarity of the electrical excitation; and support means affixed to the actuator housing, said support means engaging the the surface of said cart and being symmetrically disposed around the center of gravity of a moving-mass assembly comprising the coil and cart assembly and the element to be positioned when affixed to the coil and cart assembly such that said coil is suspended in the air gap of said magnetic means and said coil and cart assembly is supported to allow lineal movement thereof in either direction along the cart longitudinal axis and inhibit roll, pitch, and yaw movements of the coil and cart assembly.

4,287,446

STATOR FOR STEPPER MOTOR

John F. Lill, Harrisburg, and Nelson E. Neff, Hershey, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 27, 1979, Ser. No. 52,719
Int. Cl.³ H02K *11/00*
U.S. Cl. 310—71 **11 Claims**

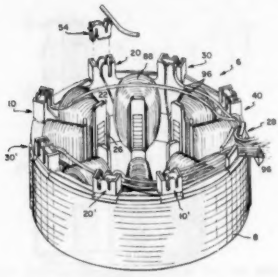
1. A stepper motor stator of the type comprising a stator core, a plurality of integral coil supports extending inwardly towards the center of said core at equally spaced angular intervals, a coil winding of coil wire on each of said coil supports with the windings on selected coil supports being connected in series by intermediate portions of said coil wires, and lead wires connected to the ends of said coil wires, said stator having:

a plurality of terminal-receiving housings mounted on said stator core, each of said housings being located proximate to an adjacent pair of said coil supports with one housing being proximate to at least every adjacent pair of coil supports excepting at least one adjacent pair,

each of said housings having terminal-receiving cavity

means therein, and each housing having a rdially inwardly directed side surface and having a radially outwardly directed side surface, coil wire-admitting slots in said side surfaces communicating with said cavity means,

said ends of said coil wires extending from said windings on said coil supports to an adjacent housing, through said coil



wire-admitting slot in said radially inwardly directed side surface, through said cavity and to said coil wire-admitting slot in said radially outwardly directed side surface, said ends being cut at said coil wire-admitting slot in said radially outwardly directed side surfaces, and

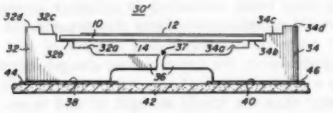
terminals in said cavities, said ends of said windings and said lead wires being electrically connected to said terminals.

4,287,447

CRYSTAL HOLDER FOR DIFFERENT SIZES OF CRYSTAL

William G. Skoda, Oak Park, and Marlin Luff, Glendale Heights, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 17, 1980, Ser. No. 112,880
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—348 **7 Claims**



1. A crystal holder for supporting a piezoelectric crystal comprising:

first and second opposed side portions of selected material, each of said portions having electrically conductive top and bottom surfaces and having at least sufficient electrically conductive external surfaces to provide electrically conductive paths from the respective top surfaces of said first and second side portions to the respective bottom surfaces thereof, the electrically conductive paths of said first side portion being electrically insulated from the electrically conductive paths of said second side portion,

said first side portion including a plurality of steps in the top surface thereof leading upwardly and away from said second side portion in stair step-like fashion, each step having a horizontal portion and a vertical portion, the horizontal portion of each step being situated at a different selected height above the bottom surface of said first side portion,

said second portion including a plurality of steps in the top surface thereof, each step having a horizontal portion and a vertical portion, the steps of said second portion leading upwardly and away from said first side portion in stair step-like fashion and in a direction opposite to that which the steps of said first side portion lead as viewed from above said first and second side portions, the horizontal portion of each step of said second side portion being horizontally aligned with a corresponding horizontal portion of a step of said first side portion,

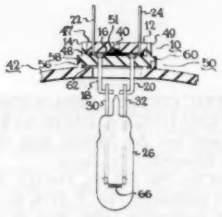
each step of said first side portion and the corresponding horizontally aligned step of said second side portion having a horizontal distance therebetween sufficient to accommodate a crystal of predetermined horizontal dimension between the respective vertical portions of such corresponding steps.

4,287,448

MECHANICAL STOP MEANS FOR A PREFOCUSED PLASTIC PAR LAMP

Irving Bradley, Novelty, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 16, 1979, Ser. No. 58,028
Int. Cl.³ H01K *1/38, 1/42*
U.S. Cl. 313—113 **7 Claims**



1. A reflector lamp with a prefocused light source mount for a light source having two lead wires extending therefrom and joined one each to metal lug members, said prefocused light source mount comprising a plastic block having mating parts defining a cavity for receiving said joined lead wires and with said mating parts comprising an inner container member which is fitted into an outer housing member and with said cavity in said block being filled with an elastomeric polymer to provide a leak-proof seal, wherein said metal lug members have a smooth surface permitting a plug-in receptacle used to supply electrical power to the lamp to be inserted so that the outermost surface of said inner container member in said plastic block provides a mechanical stop means when said plug-in receptacle is connected to said reflector lamp.

4,287,449

LIGHT-ABSORPTION FILM FOR REAR ELECTRODES OF ELECTROLUMINESCENT DISPLAY PANEL

Mikio Takeda; Hiroshi Kishishita, both of Nara; Hiroyuki Kawabata, and Kinichi Isaka, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 31, 1979, Ser. No. 8,186
Claims priority, application Japan, Feb. 3, 1978, 53-11592; Feb. 9, 1978, 53-14402; Jun. 2, 1978, 53-67095
Int. Cl.³ H05B *33/14, 33/22*
U.S. Cl. 313—509 **9 Claims**

1. A display divice comprising:

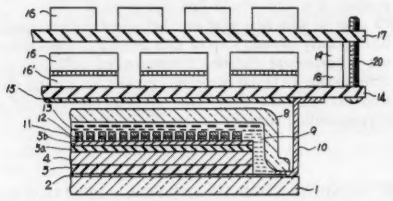
a front electrode;

a counter electrode having reflective properties;

a light emission layer interposed between said front electrode and said counter electrode for providing light emission in response to a voltage applied across the front and counter electrodes;

light-absorption layer means positioned between the light emission layer and the counter electrode, said light-absorption layer means having light-absorption properties for absorbing light applied through the front electrode, said light-absorption layer means including a first thin film and a second thin film formed over said first thin film, said

first thin film being selected from the group consisting of Al_2O_3 or Al_2O_3 -x, said second thin film formed over said



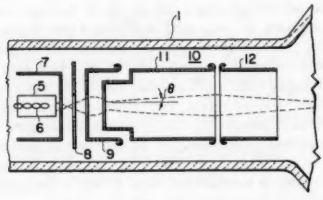
first thin film selected from the group consisting of Mo, Zr, Ti, Y, Ta, or Ni.

4,287,450

ELECTRIC CIRCUIT ARRANGEMENTS INCORPORATING CATHODE RAY TUBES

Nidehiko Kawakami, and Jun Nishida, both of No. 4896, Aza Ohtani, Ikuta, Kawasaki City, Japan

Continuation of Ser. No. 532,161, Dec. 12, 1974, Pat. No. 3,910,498. This application Nov. 9, 1976, Ser. No. 739,868
Claims priority, application Japan, May 20, 1974, 49/57079
Int. Cl.[3] H01J *29/46, 29/56*
U.S. Cl. 315—14 **3 Claims**



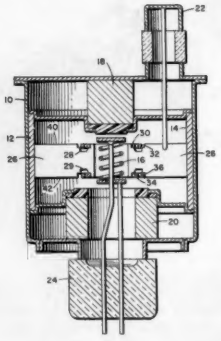
1. An electron gun assembly for a cathode ray tube which comprises, in the order named along the axis of the tube, a cathode for emitting in operation an electron stream, an apertured modulator electrode located close to the cathode for controlling the intensity of the electron stream, a first anode in the form of an apertured metal member located close to the modulator electrode, an apertured second anode located close to the first anode and a third cylindrical focusing anode of a unipotential type adjacent to the second anode, said electrodes being of such configuration, and arranged to be maintained at such potentials in operation of the arrangement, that the electron stream from the cathode is formed into a crossover between the modulator electrode and the first anode, means to effect in operation a ratio of potential applied to the second anode to potential applied to the first anode in the range between 1:1.5 and 1:6.0 and the ratio of potential applied to the third anode and to potential applied to the second anode being in the range between 1:0.006 and 1:0.04 so that said electron stream narrowed at a region adjacent to the third anode by the electric fields established between the first and second anodes and the second and third anodes and is allowed to enter the third anode at a small angle of beam spread and is focused thereby into a narrow beam of electrons whose cross-section on the screen of the tube is small.

4,287,451

MAGNETRON HAVING IMPROVED INTERCONNECTING ANODE VANES

Tokuju Koinuma, and Akira Kousaka, both of Kawasaki, Japan, assignors to Toshiba Corporation, Kawasaki, Japan

Filed Nov. 28, 1979, Ser. No. 97,958
Int. Cl.[3] H01J *23/22*
U.S. Cl. 315—39.69 **7 Claims**



1. In a magnetron comprising:
an anode having a cylindrical wall;
a cathode positioned within said anode;
a plurality of metal vanes extending radially inward from said cylindrical wall of said anode, said vanes having a free edge facing said cathode, a top edge and a bottom edge, at least one of said top and bottom edges of each of said vanes having a notch, said notches having an inner side edge nearest said free edge of said vanes, an outer side edge and a bottom edge;
a plurality of metal ring straps comprising an inner ring strap and an outer ring strap connected to said notches, said inner ring strap being connected to alternate ones of said plurality of metal vanes on said inner side edges of said notches of said alternate ones of said vanes and said outer ring strap being connected to different alternate vanes than said alternate ones of said plurality of metal vanes on said outer side edges of said notches of said different alternate vanes, the improvement comprising said metal ring straps being formed of metal having a tensile strength greater than the tensile strength of said vanes and said inner edge of said notches having a slanting edge at an angle less than 90° with said bottom edge of said notches between the connection of said inner ring strap and said bottom edge of said notches.

4,287,452

MULTIPLE FILAMENT ELECTRIC LAMP

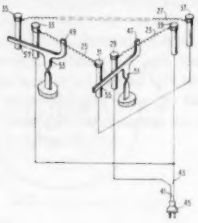
Leslie U. Fernandez, III, R.D. 3, Box 364, Chippewa Rd., Putnam Valley, N.Y. 10579

Filed Dec. 3, 1979, Ser. No. 99,425
Int. Cl.[3] H01J *7/44, 17/34, 19/78;* **H01K** *1/62*
U.S. Cl. 315—65 **14 Claims**

1. An incandescent electric lightbulb mount comprising:
A. a first filament consisting essentially of conductive material capable of incandescing in a closed electric circuit,
B. one or more alternate filaments consisting essentially of material capable of incandescing in a closed electric circuit,
C. leads placing said first filament in a closed electric circuit,
D. leads placing said alternate filament(s) in an open electric circuit,
E. one or more switching members, the number of switching members being equal to one less than the total number of filaments in said mount, said switching members having as

parts; (i) a projection to contact a filament, (ii) an elastic component to make said member elastically deformable, and (iii) a conductive arm to transfer electric current,

F. a first filament switching member contacting said first filament and a switching member associated with and contacting each but one of said alternate filaments, wherein each of said switching member(s) is held in an



elastically deformed first position by its associated filament, each of said switching members being arranged so that upon rupture of a filament the associated switching member moves to an elastically relaxed second position and thereby places an unused alternate filament in a closed electric circuit,

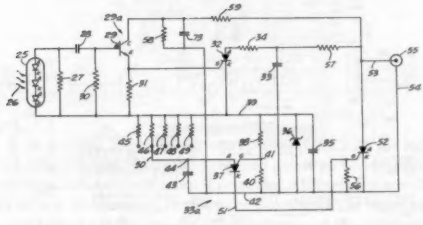
G. support means for positioning said leads, filaments, and switching member(s).

4,287,453

ELECTRONIC SLAVE FLASH DELAY DEVICE

Jean M. Orban, Santa Monica, Calif., assignor to Vivitar Corporation, Santa Monica, Calif.

Filed Sep. 6, 1979, Ser. No. 72,896
Int. Cl.³ H05B *41/34*
U.S. Cl. 315—159 **33 Claims**



1. A device for activating an electronic slave flash unit including in a circuit

light sensing means adapted to be responsive to a light impulse from a master flash unit to thereby generate a first signal;

delay circuit means including control means for providing different time delays, said delay circuit means being responsive to said first signal and operative, after a predetermined selected time delay, to generate a switching signal; and

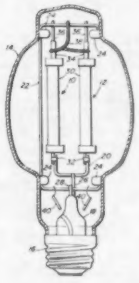
switching means responsive to the switching signal and adapted to activate the associated flash unit.

4,287,454

HIGH PRESSURE DISCHARGE LAMPS WITH FAST RESTART

Alfred E. Feuersanger, Framingham; Leslie A. Riseberg, Sudbury, and William H. McNeill, Carlisle, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 17, 1979, Ser. No. 104,334
Int. Cl.³ H05B *35/00, 37/00, 39/00, 41/00*
U.S. Cl. 315—178 **16 Claims**



1. Electromagnetic discharge apparatus comprising:

a plurality of high intensity discharge means adapted for coupling to a source of starting and operating voltage and electrically coupled so that substantially the same voltage is applied to all of said discharge means, said discharge means having the characteristic that discharge cannot be initiated therein by a normal starting voltage when said discharge means is above a predetermined temperature, said discharge means having sufficient thermal isolation therebetween that, when a discharge, previously established in one of said discharge means, is extinguished, at least one other of said discharge means is below said predetermined temperature, whereby discharge is initiated in one other of said plurality of discharge means substantially immediately after said previously established discharge is extinguished and said discharge means having sufficient thermal coupling therebetween that, when said one discharge means is hot, said other discharge means is preheated to a temperature below said predetermined temperature, whereby said other discharge means requires less time after initiation of discharge to reach full output than when said other discharge means is not preheated.

4,287,455

POWER SAVING CIRCUIT FOR GASEOUS DISCHARGE LAMPS

Maurice L. Drieu, Toronto, Canada, assignor to Erin Engineering (Ontario) Ltd., Mississauga, Canada

Filed Dec. 18, 1979, Ser. No. 105,001
Int. Cl.³ H05B *41/36*
U.S. Cl. 315—199 **14 Claims**

1. A power saving circuit for a gaseous discharge lamp comprising,

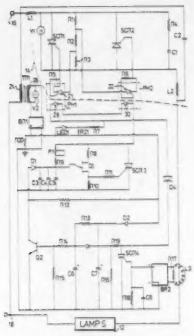
a power circuit connectable to an AC power supply and to at least one lamp, said power circuit including a bilateral current conducting power switch having control electrode means,

a control circuit including a control switch having control electrode means, and timing means operable to apply a signal to said control electrode means of said control switch to render said control switch conducting at a predetermined time during each half cycle of the AC power supply, said control switch conducting current until zero crossover at the end of each half cycle,

opto-coupler means associated with the control switch on the one hand and with the control electrode means of the

power switch on the other hand to cause actuation of the control electrode means of the power switch and subsequent current conduction by the power switch when the control switch is conducting,

said control electrode means of said power switch being connected through the opto-coupler means to the power



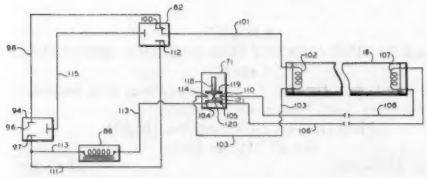
circuit to cause, while the opto-coupler means is actuated by current conduction through the control switch, adequate power switch actuating current to flow therethrough when the power switch is not conducting and substantially reduced or no current to flow therethrough when the power switch is conducting.

4,287,456

PORTABLE FLUORESCENT TUBE ASSEMBLY HAVING LOW VOLTAGE CONVENIENCE OUTLET

James W. Kovacik; James D. Kovacik, both of Parma; Thomas J. Blanch, Aurora, and Paul S. Blanch, Garfield Heights, all of Ohio, assignors to Alert Safety Lite Products Company, Bedford Heights, Ohio

Filed Dec. 6, 1979, Ser. No. 100,998
Int. Cl.³ H05B *41/18*
U.S. Cl. 315—283 **12 Claims**



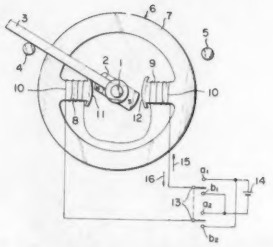
1. In a fluorescent tube assembly having starter switch means and an electric convenience outlet associated with the assembly but apart from terminals of such fluorescent tube, electric circuitry therefor comprising conductors adapted to be connected to a source of electrical energy having a predetermined voltage, one of said conductors being connected in series to said convenience outlet and said starter switch means, another of said conductors being connected to said convenience outlet and in parallel through ballast means to said starter switch means, whereby said predetermined voltage is supplied to said convenience outlet associated with the tube assembly, and another and higher voltage is applied to said starter switch means and fluorescent tube for starting the same.

4,287,457

ELECTROMAGNETIC ROTATING APPARATUS

Yoshihiro Takemura, Ijima, Japan, assignor to Shinano Tokki Corporation, Japan

Filed May 22, 1978, Ser. No. 907,907
Claims priority, application Japan, Aug. 20, 1977, 52/99726
Int. Cl.³ H02K *33/00*
U.S. Cl. 318—133 **16 Claims**



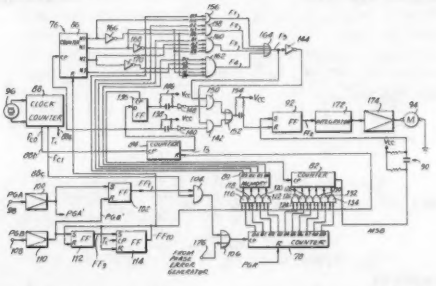
1. Electromagnetic rotating apparatus comprising a rotating shaft, a bipolar permanent magnet fixed to said rotating shaft and radially magnetized, a fixed coil disposed to interlink with the magnetic flux of said permanent magnet, symmetrically with respect to said rotating shaft, the fixed coil providing a magnetic field perpendicular to the axis of said rotating shaft when energized, first and second stoppers to limit the rotation of said permanent magnet within an angular range of less than 180 degrees and stop the rotation thereof before said permanent magnet reaches a position where the number of magnetic flux interlinking with said fixed coil becomes maximum, and an energizing circuit to selectively energize said fixed coil positively or inversely.

4,287,458

DIGITAL SERVO CONTROL CIRCUIT

Tadahiko Nakamura, and Kenji Nakano, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 28, 1979, Ser. No. 70,523
Claims priority, application Japan, Aug. 30, 1978, 53-104899
Int. Cl.³ H02P *5/16*
U.S. Cl. 318—341 **1 Claim**



1. A digital servo apparatus for controlling rotation of a rotary member comprising:

means for generating at least one angular position signal related to an angular position of said rotary member;

means for generating at least one reference signal;

means for generating cycles of a clock signal;

means for defining a basic timing interval;

means for storing a plurality of bits corresponding to a number of said cycles associated with a time interval between said reference signal and said at least one angular position signal;

means for generating a predetermined plurality of pulses of a pulse width modulated pulse train in each said basic timing interval, all of said predetermined plurality of pulses being generated with equal ON and OFF times determined in response to at least some of said plurality of bits;

means for modifying said ON times of individual ones of said pulses scattered through said predetermined plurality of pulses in said basic timing interval to produce a total of all of said ON times in said basic timing interval which is responsive to all of said plurality of bits; and

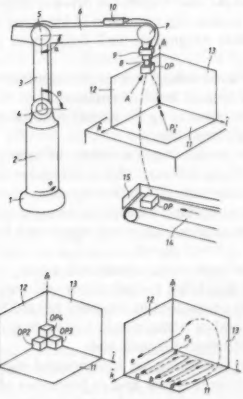
means for controlling rotation of said rotary member in response to said total of all of said ON times in said pulse width modulated pulse train, whereby said angular position signal and said reference signal are maintained in a predetermined relationship.

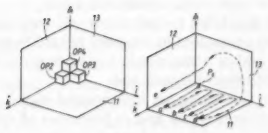
4,287,459

METHOD FOR GENERATING A PATTERN BY MEANS OF AN INDUSTRIAL ROBOT AND INDUSTRIAL ROBOT FOR CARRYING OUT THE METHOD

Lars Dahlström, Vesteras, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Filed Nov. 6, 1979, Ser. No. 92,243
Claims priority, application Sweden, Nov. 27, 1978, 7812165
Int. Cl.³ G05B *19/42*
U.S. Cl. 318—568 **10 Claims**





1. A method for handling workpieces (OP) with an industrial robot (**1–10**), which are arranged or are to be arranged in a pattern, wherein said robot is provided with sensing members (**9**) which are arranged to sense the position of the robot or of a workpiece carried by the robot relative to the workpieces positioned in the pattern, comprising the steps of,

controlling the robot or a workpiece carried by the robot to adopt a predetermined preliminary position relative to workpieces already positioned in the pattern,

utilizing said sensing members, controlling said robot or a workpiece carried thereby to assume a final position,

storing said final position,

utilizing said stored final position as a starting value, calculating the preliminary position of an adjacent workpiece in the pattern, and

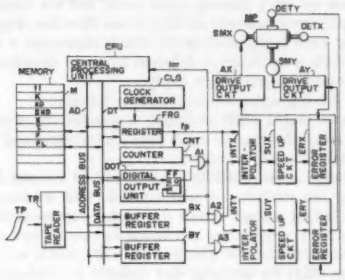
controlling said robot or a workpiece carried thereby to assume said calculated preliminary position.

4,287,460

POSITIONING CONTROL SYSTEM

Ryoichiro Nozawa, Tokyo; Yoichi Amemiya, Hachioji; Mitsuo Matsui, Tokyo; Shigeru Isohata, Hino; Takao Sasaki, Hachioji, and Yoshitaka Takekoshi, Hino, all of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Mar. 13, 1979, Ser. No. 20,197
Claims priority, application Japan, Mar. 16, 1978, 53-30412
Int. Cl.³ G05B *19/24*
U.S. Cl. 318—571 **5 Claims**



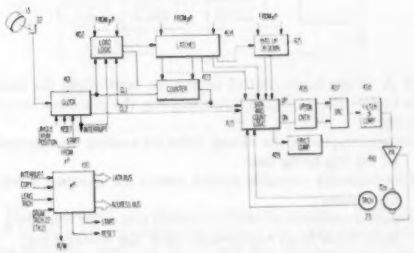
1. A positioning control system for a movable part of a machine under numerical control, said movable part having a known period of vibration, said system comprising means for positioning the machine in a time corresponding to the vibration period and means for controlling the accelerating and decelerating of said machine in predetermined portions of the positioning time to move the movable part to a commanded position in the positioning time.

4,287,461

MOTOR DRIVING SYSTEM

George G. Promis, Arvada; Gerald L. Smith, Broomfield, and John C. Wilson, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 6, 1979, Ser. No. 100,773
Int. Cl.³ G05B *24/19*
U.S. Cl. 318—571 **48 Claims**



1. A translation system to produce a controlled and repeatable position and velocity profile of a controlled object with respect to an independent parameter including a single control loop with driving means including a servo motor coupled to and driving said controlled object,

tachometer means (**23**) responsive to driving means movement for producing an output signal representative of direction of driving means movement and including a series of tachometer pulses, each pulse representing a given increment of driving means movement,

an up/down counter (**406**),

coupling means (**407**, **408**, **410**) coupling said up/down

counter to said driving means for driving said servo motor with a level representative of the contents of said up/down counter,

driving signal source means **(401, 402, 403, 404, 100)** for producing a driving signal pulse train, each pulse representing a desired increment of driving means movement and a direction signal representative of desired direction of driving means movement,

logic means **(405)** coupling said output signal, said driving signal pulse train and said direction signal to said up/down counter for stepping said up/down counter in one direction for each driving signal pulse and for stepping said up/down counter in another or one direction respectively, for each tachometer pulse which represents a direction which is the same or different from the direction of said direction signal, respectively,

said driving signal source means including,

counter means **(403)** including a counter for producing a driving signal pulse each time a predetermined count is attained in said counter,

modulus means **(404,100)** coupled to said counter for altering the modulus of said counter, said modulus means including storage means for storing representations of a plurality of quantities and means for presenting a predetermined sequence of quantities to said counter means, and

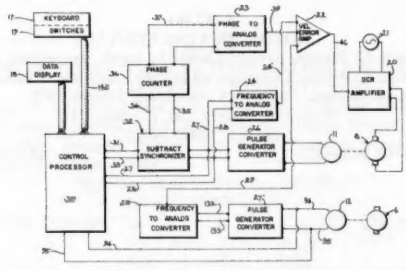
means **(401)** for stepping said counter in accordance with said independent parameter.

4,287,462

VENEER LATHE CONTROL SYSTEM

Thomas L. Beck, Union Grove, and Rick L. Tennessen, Racine, both of Wis., assignors to Unico, Inc., Milwaukee, Wis.

Filed May 13, 1980, Ser. No. 149,527
Int. Cl.³ B27L *5/02*; G05B *19/24*
U.S. Cl. 318—571 **3 Claims**



1. A veneer lathe control system for controlling the motion of a knife with respect to a rotating log, the combination comprising:

means coupled to the veneer lathe for sensing the orientation of the log being cut;

first manually operable switch means for selecting a retract operation;

means responsive to said first switch means for retracting the lathe knife from engagement with the rotating log;

means coupled to said retracting means and said log orientation sensing means for storing data indicative of absolute log orientation at the moment the knife disengages the rotating log during a retract operation;

second manually operable switch means for selecting a peeling operation; and

means responsive to said second manually operable switch for generating position command signals that feed the lathe knife forward into engagement with the rotating log to cut veneer, said means including

(a) first means for generating a position command synchronization signal for feeding the knife forward into engagement with the rotating log at substantially the same point on the log surface at which the knife was disengaged during said retract operation, and

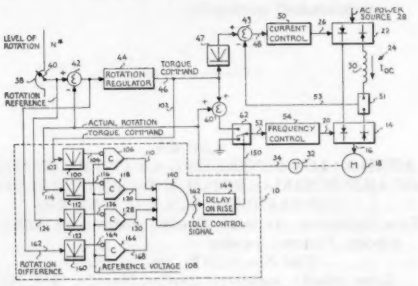
(b) second means for generating a peel position command signal for feeding the knife forward to cut veneer of a predetermined thickness.

4,287,463

ZERO ROTATION AND ZERO TORQUE DETECTOR AND METHOD FOR AN AC ELECTRIC MOTOR DRIVE

Loren H. Walker, Salem, and John H. Cutler, Roanoke, both of Va., assignors to General Electric Company, Salem, Va.

Filed Apr. 24, 1979, Ser. No. 32,855
Int. Cl.³ H02P *5/00*
U.S. Cl. 318—803 **21 Claims**



1. A substantially zero rotation and substantially zero torque apparatus for an AC electric motor drive system having an AC electric motor producing a rotation in response to an outgoing signal of variable magnitude and frequency, said apparatus comprising:

(a) means for establishing a rotation reference signal proportional to a desired level of rotation;

(b) means for generating an actual rotation signal proportional to said rotation;

(c) means for generating a rotation difference signal representative of any difference between said rotation reference signal and said actual rotation signal;

(d) means for supplying a torque command signal as a function of said rotation difference signal and for producing a frequency control signal and a current control signal as functions of said torque command signal;

(e) means for supplying to said motor said outgoing signal at a frequency controlled in response to said frequency control signal and at a magnitude varied in accordance with said current control signal; and

(f) means for furnishing an idle control signal when said torque command signal and at least two of said rotation reference signal, said actual rotation signal, and said rotation difference signal are less than respective predetermined values, whereby said idle control signal indicates that the drive system is in a substantially zero rotation and substantially zero torque state and is effective to control an operation parameter of said drive system.

4,287,464

POWER FACTOR CONTROLLER FOR AN INDUCTION MOTOR USING TRANSISTOR SWITCH MEANS WITH VARIABLE BREAKDOWN VOLTAGE

Maw H. Lee, Broadview Heights, and John E. Keim, Lodi, Both of Ohio, assignors to The Scott & Fetzer Company, Cleveland, Ohio

Filed Dec. 17, 1979, Ser. No. 104,700
Int. Cl.³ H02P *7/36, 7/58*
U.S. Cl. 318—805 **6 Claims**

1. An electronic controller for regulating power applied by an AC supply to an AC induction motor comprising:

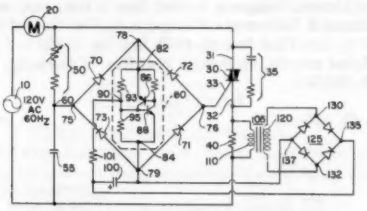
a gate-controlled semiconductor AC switching means connected in electrical series relationship with the AC supply and the induction motor, power being applied to the motor via the AC switching means;

means for detecting alternating direction load current pulses through the motor when the AC switching means is in a conducting state, the means for detecting including a resistor means in series with the motor, the resistor means providing a proportional voltage pulse for each load current pulse;

an RC network including a capacitor charging in alternating voltage polarities from the application of AC supply voltage when the semiconductor switch is in a non-conducting condition;

full wave rectifier means for converting at least a portion of the alternating polarity AC voltage across the capacitor to a single polarity DC voltage;

a unidirectional current transistor switch means configured to function as a trigger diode having a variable breakdown voltage, the transistor switch means being connected to drive the gate electrode of the AC semiconductor switch-



ing means, the DC voltage being supplied by the capacitor to the transistor switch means via the rectifier means, the transistor switch means switching to a fully conducting condition at a breakdown voltage attained by the charging capacitor, wherein turn-on current is applied to the gate electrode of the semiconductor switch to trigger it into a conducting condition, the semiconductor switching means switching to a non-conducting state generally at the trailing edge of each load current pulse when the turn-on current is not applied to the gate electrode of the semiconductor switching means; and

control means responsive to the proportional voltage pulses provided by the resistor means, the control means being connected to the transistor switch means to vary its breakdown voltage in accordance with the amplitude of the proportional voltage pulses, an increase in the amplitude of the proportional voltage pulses causing, via the control means, a decrease in the breakdown voltage of the transistor switch means, a decrease in the amplitude of the proportional voltage pulses causing, via the control means, an increase in the breakdown voltage of the transistor switch means.

4,287,465

APPARATUS FOR REGULATING THE CHARGING OF A STORAGE BATTERY

Pierre Godard, Tremblay les Gonesse, and Michel Billot, Drancy, both of France, assignors to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Oct. 5, 1979, Ser. No. 83,190

Claims priority, application France, Oct. 9, 1978, 78 28752

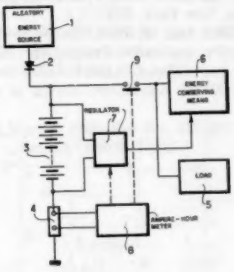
Int. Cl.[3] H02J *3/32, 7/04, 7/34*

U.S. Cl. 320—56 **8 Claims**

1. Apparatus for regulating the charging of a storage battery from an aleatory source of electric energy in an electric energy supply system which includes an aleatory source of electric energy and a storage battery connected to said aleatory source for charging thereby, wherein said regulating apparatus comprises:

a motor-generator set which includes a variable speed motor driving an asynchronous machine for coupling the storage battery and the aleatory source to a load and to an AC mains electric supply grid;

means for diverting electric current being supplied by the



system to said AC mains whenever the charge of the storage battery reaches a given level and the current available from the aleatory source exceeds the load demand; and

means for controlling the allocation of said excess electric current from the aleatory source to the storage battery and to the AC mains as a function of at least one parameter representing the state of charge of the battery.

4,287,466

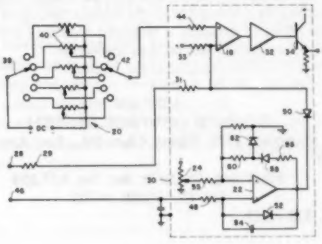
CONTROL CIRCUITRY FOR MAINTAINING FORWARD AND REFLECTED TRANSMISSION LINE POWER AT A PREDETERMINED SAFE LEVEL

Donald L. Quick, Mountain View, Calif., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 26, 1979, Ser. No. 15,090

Int. Cl.[3] G05F *1/66*

U.S. Cl. 323—275 **9 Claims**



1. Power control circuitry for controlling the power produced by an A.C. generator, the control circuitry comprising:

first amplifier circuitry for comparing the level of a first input signal representing the A.C. voltage across the generator load and a second input signal representing one of a plurality of preselected desired output levels of said generator:

power amplifying circuitry coupled to the output of said first amplifier circuitry for producing a power output control signal for said A.C. generator;

second amplifier circuitry for comparing the level of a preselected threshold with a third input signal representing the power reflected from the load toward the A.C. generator; and

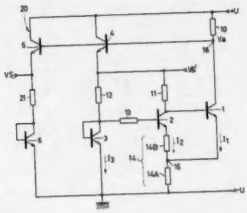
switching means coupled to the output of said second amplifier circuitry and to the input of said first amplifier cir-

cuitry for removing said first input signal from said first amplifier circuitry whenever said third input signal exceeds the level of said threshold signal.

4,287,467
CONSTANT-VOLTAGE GENERATOR FOR INTEGRATED CIRCUITS

Gilbert Y. M. Gloaguen, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 16, 1980, Ser. No. 140,943
Claims priority, application France, Apr. 20, 1979, 79 10085
Int. Cl.³ G05F *3/20*
U.S. Cl. 323—314 **12 Claims**

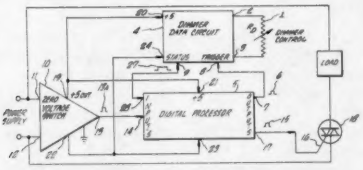


8. A voltage regulator circuit comprising, first and second terminals for receiving operating voltages for the circuit, an output terminal for supplying a stabilized voltage independent of the operating voltages and ambient temperature, first and second transistors each having emitter, collector and base electrodes, a diode, first means coupling the collector of the second transistor to the base of the first transistor, a coupling network including a first resistor for coupling the collector of the first transistor to the base of the second transistor, first means connecting said diode in series with the first resistor between the second terminal and the base of the second transistor, a second resistor connected between the emitter of the second transistor and the second terminal thereby forming an emitter circuit for the second transistor, second means coupling the collector of the first transistor to said first terminal and to said output terminal, and second means connecting the emitter of the first transistor to the emitter circuit of the second transistor so as to produce a negative feedback component in said emitter circuit of the second transistor.

4,287,468
DIMMER CONTROL SYSTEM

Robert Sherman, 1555 Rising Glen Rd., Los Angeles, Calif. 90069

Filed Aug. 28, 1978, Ser. No. 937,258
Int. Cl.³ H05B *37/02*
U.S. Cl. 323—322 **20 Claims**



4. A dimmer apparatus for varying the average power dissipation in a load comprising:

(a) a dimmer control;

(b) a dimmer data means connected to said dimmer control for generating a dimmer data signal representing the desired level of power dissipation in said load;

(c) zero crossing means connected to a power supply for determining the times of zero crossings of the power supply voltage waveform and for generating data indicating the times of said zero crossings;

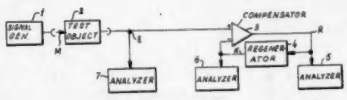
(d) an output means connected to a load and to said power supply for switching complete half cycles of said power supply voltage waveform through said load when triggered by an output trigger pulse; and

(e) a digital processor means connected to said dimmer data means and to said zero crossing means and to said output means for sampling the data generated by said dimmer data means and for performing logic operations on data arriving from said dimmer data means and from said zero crossing means, said logic operations for deriving criteria based on data from said dimmer data means and for sending a complete half cycle from zero crossing to zero crossing of said power supply voltage waveform through said load when the derived criteria for sending such a half cycle is met.

4,287,469
PROCESS AND CIRCUIT ARRANGEMENT FOR THE MEASURING OF COEFFICIENTS OF MESSAGE-TRANSMISSION EQUIPMENT

Peter Harzer, Eningen u. A., Fed. Rep. of Germany, assignor to Wandel & Goltermann, Eningen u. A., Fed. Rep. of Germany

Filed Jun. 12, 1979, Ser. No. 47,927
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1978, 2827422
Int. Cl.³ G01R *27/26*
U.S. Cl. 324—57 R **28 Claims**



1. A process for measuring transmission characteristics of a test object, comprising the steps of:

(a) generating a measuring signal including at least one predetermined test frequency;

(b) applying said measuring signal to an input of the test object;

(c) extracting a distorted signal from an output of the test object;

(d) generating a compensation signal including at least one local oscillation corresponding to said test frequency;

(e) differentially combining said distorted signal and said compensation signal to produce a residual signal;

(f) varying the relative phase and amplitude of said local oscillation and said distorted signal until said test frequency substantially disappears in said residual signal; and

(g) deriving at least one coefficient representative of a transmission characteristic from at least one of said residual and compensation signals.

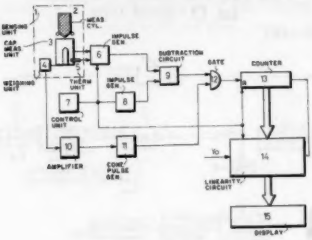
4,287,470
DIGITAL HUMIDIMETER

Zsolt Fabian; Mihaly Samu, both of Gödöllö, and Barnabas Balogh, Budapest, all of Hungary, assignors to Mém Müszaki Intézet, Gödöllö, Hungary

Filed Feb. 12, 1979, Ser. No. 11,094
Int. Cl.³ G01R *27/26*
U.S. Cl. 324—61 R **3 Claims**

1. A capacitance and resistance measuring appraratus for the determination of a capacitance value, a resistance value and the difference between two capacitances and two resistances, the apparatus comprising: two RC impulse generators, a control circuit, a subtraction circuit, a gate, a counter, a controllable pulse generator and a display, wherein the resistance or capacitor to be measured is connected to the input of the one pulse

generator, the other resistance or capacitor to be measured is connected to the other pulse generator, the output of the control circuit is connected to the triggering inputs of the pulse generators, the outputs of the pulse generators are connected to the input of the subtraction circuit, the output of the subtraction circuit is connected to one input of the gate, the other



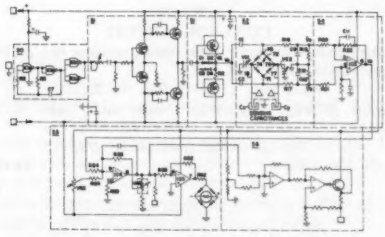
input of the gate is connected to the output of the controllable pulse generator, a driving signal is connected to the input of the controllable pulse generator, the output of the gate is connected to the input of the counter, the reset input of the counter is connected to the output of the control circuit and the output of the counter is connected to the input of the display.

4,287,471

STRIP CENTER LINE SENSOR

Wen H. Ko, Cleveland Heights, and Chih P. Hung, Berea, both of Ohio, assignors to North American Manufacturing Company, Cleveland, Ohio

Filed May 23, 1979, Ser. No. 41,875
Int. Cl.[3] G01R *27/26*
U.S. Cl. 324—61 R **3 Claims**



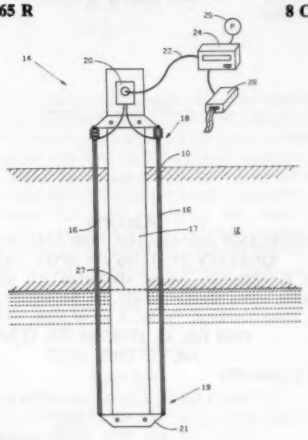
1. In a capacitance type detecting device for the edges of a moving metal strip having first and second capacitor plates each having a segment thereof overlapping an opposite edge of the strip and capacitively coacting with said strip to form a first capacitor and a second capacitor; said strip being at a reference potential; means energizing said capacitor plates with an alternating current referenced to said reference potential and indicating means for producing an output signal indicating movement of the strip laterally relative to the capacitor plates, the improvement which comprises: said indicating means comprising a diode bridge including first, second, third and fourth bridge terminals consecutively coupled together by four diodes polarized in circulating relationship, means connecting said second bridge terminal to said first capacitor plate, means connecting said fourth bridge terminal to said second capacitor plate; said energizing means being comprised of means generating a square wave, means amplifying said square wave to a constant amplitude, means feeding said amplified square wave through a first reactance to said first diode bridge terminal and means feeding said amplified square wave through a second reactance to said third diode bridge terminal; and, said indicating means reading an output voltage between said first diode bridge terminal and said third diode bridge terminal proportional to lateral variations of position of the moving strip.

4,287,472

METHOD FOR MEASURING THE THICKNESS OF AN ICE SHEET

Robert B. Pan, and John S. Templeton, III, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Mar. 3, 1980, Ser. No. 126,587
Int. Cl.[3] G01R *27/02*
U.S. Cl. 324—65 R **8 Claims**



1. A method for measuring the thickness of an ice sheet floating at the surface of a body of water with a circuit whose resistance is a function of the length of the circuit embedded in the ice, said method comprising the steps of:

(a) transmitting an electric current through the circuit;

(b) measuring the electric resistance of the circuit as the current passes through the circuit; and

(c) determining the thickness of the ice sheet by correlating the measured resistance of the circuit with predetermined calibrated ice thickness values.

4,287,473

NONDESTRUCTIVE METHOD FOR DETECTING DEFECTS IN PHOTODETECTOR AND SOLAR CELL DEVICES

David E. Sawyer, Rockville, Md., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

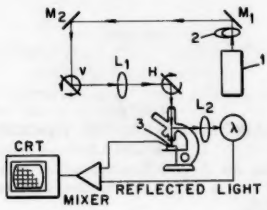
Filed May 25, 1979, Ser. No. 42,462
Int. Cl.[3] G01R *31/26*
U.S. Cl. 324—158 R **12 Claims**

1. A method for detecting defects in semiconductor devices including:

forward-biasing the semiconductor device with an illuminator;

scanning the forward-biased semiconductor with a light spot;

detecting the output voltage;



mapping the device topography from the detected output voltage.

4,287,474

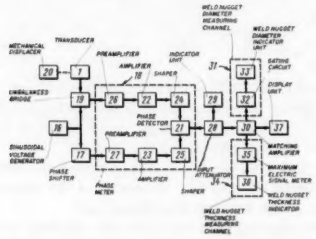
METHOD AND APPARATUS FOR NON-DESTRUCTIVE QUALITY TESTING OF SPOT WELDS

Viktor S. Fastritsky, ulitsa Michurina, 27, kv. 14; Pavel S. Fishkin, ulitsa Maskavas, 427, kv. 54, and Evgeny P. Rybalkin, ulitsa Gorkogo, 78, kv. 2, all of Riga, U.S.S.R.

Filed Feb. 12, 1979, Ser. No. 11,546

Int. Cl.³ G01R *33/12*

U.S. Cl. 324—233 **5 Claims**



2. An apparatus for non-destructive quality testing of spot welds, comprising:

(a) a sinusoidal voltage generator;

(b) a reference channel having a phase shifter with its input connected to the output of said sinusoidal voltage generator;

(c) a measuring channel having an unbalanced bridge circuit and having its input connected to the output of said sinusoidal voltage generator;

(d) a phase meter having its inputs connected to the outputs of said phase shifter and unbalanced bridge circuit;

(e) an eddy current transducer arranged in one of the branches of said unbalanced bridge circuit;

(f) means for mechanically displacing said eddy current transducer in a plane parallel to the surface of contact of the welded parts;

(g) means connected to said phase meter for measuring the thickness of a weld nugget; and

(h) means connected to said phase meter for measuring the diameter of a weld nugget.

4,287,475

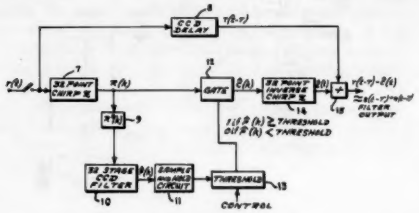
CIRCUIT FOR THE ADAPTIVE SUPPRESSION OF NARROW BAND INTERFERENCE

William G. Eaton, and Allan W. Roeder, both of Whitesboro, N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 5, 1979, Ser. No. 82,355

Int. Cl.³ H04B *1/10*

U.S. Cl. 328—167 **6 Claims**



1. A circuit for the adaptive suppression of narrow band interference comprising

means receiving analog signals,

Fourier transform means performing an N point weighted Fourier transform on said received analog signals,

squaring means for squaring the output of said Fourier transform means,

recursive filter means for filtering the output of said squaring means to provide a smoothed power spectral density signal, and

an interference signal cancelling circuit receiving said smoothed power spectral density signal and cancelling interference signals from said received analog input signals in response thereto.

4,287,476

CONTROL CIRCUIT

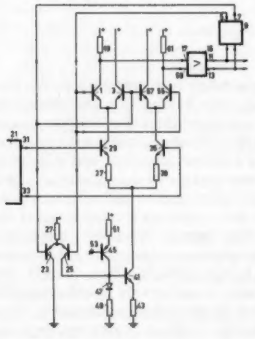
Adriaan Cense, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 23, 1979, Ser. No. 23,220

Claims priority, application Netherlands, Apr. 4, 1978, 7803561

Int. Cl.³ H03F *3/45*; H03G *3/32*

U.S. Cl. 330—254 **13 Claims**



1. A control circuit comprising first and second transistors each having emitter, base and collector electrodes, input means coupling the emitters of the first and second transistors to a signal source, means coupling the bases of the first and second transistors to a control signal source for controlling the gain of the control circuit and further coupling the collector of one of

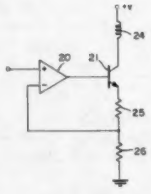
said transistors to an output of the control circuit for obtaining an output signal thereat having an amplitude controllable by the control signal source, said control circuit further comprising a circuit included in the emitter circuit of the first and second transistors through which a direct current only flows and which is responsive to the control signal source for controlling a direct current component in the output signal in a sense opposite to that of the circuit gain.

4,287,477

FEEDBACK ARRANGEMENT

George C. Carlsen, II, Redondo Beach; John C. Crumm, Pacific Palisades, both of Calif., and Koji Matsuda, Kyoto, Japan, assignors to Dynamic Compliance, Incorporated, Santa Monica, Calif.

Filed Feb. 22, 1979, Ser. No. 13,815
Int. Cl.³ H03F *1/34, 3/26*
U.S. Cl. 330—255 **3 Claims**



1. A feedback arrangement for correcting distortion in an amplifier system, the distortion resulting from nonlinearities in the amplifier system and a load connected thereto, said feedback arrangement comprising:

a differential amplifier having positive and negative input terminals, and having an output terminal,

a power output transistor having a base, an emitter, and a collector, the base of said transistor being connected to the output terminal of said differential amplifier,

an inductive load connected between the collector of said power output transistor and the positive terminal of a voltage supply,

an emitter bias resistor having one end connected to the emitter of said transistor, and

an error-sensing resistor having one end connected to the other end of said emitter bias resistor and having the other end connected to the negative terminal of said voltage supply,

the negative terminal of said differential amplifier being connected to the junction between said error-sensing resistor and said emitter bias resistor,

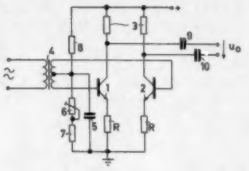
the value of said error-sensing resistor being chosen such that the voltage across said error-sensing resistor substantially equals the voltage applied to the positive terminal of said differential amplifier whereby an input signal applied to the positive terminal of said differential amplifier provides 100 percent negative feedback to said differential amplifier resulting in an error-correcting feedback signal which corrects nonlinearities introduced by said amplifier system and said load when processed by said amplifier system.

4,287,478

AMPLIFIER ARRANGEMENT COMPRISING TWO TRANSISTORS

Hermann Berger, Innsbruck, Austria, assignor to U.S. Philips Corp., New York, N.Y.

Filed Apr. 9, 1979, Ser. No. 28,481
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1978, 2819087
Int. Cl.³ H03F *3/30, 3/45*
U.S. Cl. 330—256 **11 Claims**



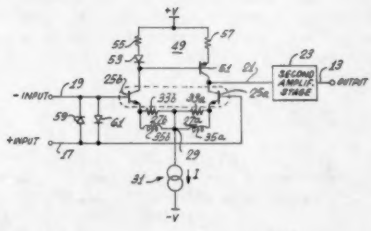
1. An amplifier arrangement comprising, first and second transistors each having an emitter, base and collector electrode, a pair of input terminals coupled to the base electrodes of the transistors for applying an input signal thereto in phase opposition, a pair of signal output terminals coupled to the collector electrodes of the first and second transistors, and a symmetrical resistor network connecting the emitter electrodes of the transistors to a point of constant potential, said resistor network being proportioned so that the slope of each of said first and second transistors is smaller than the value I_{CO}/U_T by a factor a, where I_{CO} is the collector quiescent current of a transistor, U_T is the thermal voltage, and a is a factor between 0.47 and 0.78.

4,287,479

OPERATIONAL AMPLIFIER CIRCUIT

Deane E. Jensen, 1617 N. Fuller Ave., Hollywood, Calif. 90046

Filed Jun. 22, 1979, Ser. No. 51,230
Int. Cl.³ H03F *3/45*
U.S. Cl. 330—260 **9 Claims**



1. For use in an operational amplifier circuit, a first amplification stage comprising:

first and second matched transistors, each transistor having an input terminal, a common terminal, and an output terminal; and

first and second reactive networks coupling the common terminals of said respective first and second transistors to a common node, each of said reactive networks including an inductor and a resistor arranged in a shunt configuration, whereby each network has a relatively low impedance at low frequencies and a relatively high impedance at high frequencies;

wherein an output signal, proportional to the difference between two input signals applied to the input terminals of said respective first and second transistors, is produced at the output terminal of one of the transistors;

wherein at frequencies less than a prescribed frequency

where the impedance of each emitter inductor is equal to the impedance of the corresponding resistor, the open-loop gain of the first amplification stage is substantially increased and substantially less noise is generated; and

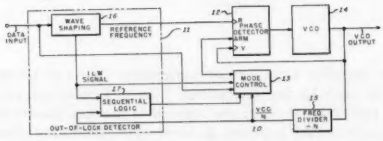
wherein at frequencies greater than the prescribed frequency, the open-loop gain of the circuit is sufficiently low that stability is maintained.

4,287,480

PHASE LOCKED LOOP OUT-OF-LOCK DETECTOR

Billy K. Swift; Anthony F. Zizzo, both of Phoenix, and Willard A. Blevins, Glendale, all of Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Jan. 10, 1980, Ser. No. 111,134
Int. Cl.[3] H03L *7/10*
U.S. Cl. 331—1 A **5 Claims**



1. A circuit for detecting an out-of-lock condition of a digital phase locked loop, having a phase detector, a voltage controlled oscillator, and a frequency divider, which comprises:

wave shaping means having input terminal means for receiving an input signal, and output terminal means for providing said digital phase locked loop with a window signal having periodic pulses of a fixed time width and a stable reference signal; and

sequential logic means coupled to the output terminal means of said wave shaping means and coupled to the output terminal means of said digital phase locked loop, for receiving the window signal from said wave shaping means and the voltage controlled oscillator's output signal from said digital phase locked loop, for detecting the occurrence of an edge of the voltage controlled oscillator's output signal wihin a pulse of the window signal during a plurality of states, and for signalling the existence of selected states in which the edge of the voltage controlled oscillator's output signal does not occur within a pulse of the window signal.

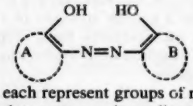
4,287,481

DYE LASERS

Marcos Kleinerman, 24 Jerome St., Southbridge, Mass. 01550

Filed Nov. 22, 1978, Ser. No. 963,157
Int. Cl.[3] H01S *3/20*
U.S. Cl. 331—94.5 L **7 Claims**

1. A dye laser comprising a laser dye solution and a pumping energy source operably coupled therewith and capable of producing stimulated emission of the dye solution, said dye solution comprising a lasing concentration of a dye in a noninterfering solvent, said dye being selected from the group of Aluminum complexes of organic compounds having the formula



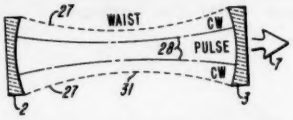
wherein A and B each represent groups of non-metallic atoms necessary to complete an aromatic cyclic structure, said compounds selected from the group consisting of the dyes Lumogallion, CI Mordant Blue 9, CI Mordant Blue 13, Flazo Orange, CI Mordant Violet 5 and CI Mordant Black 3.

4,287,482

CW-PULSED LASER

John C. Wert, III, 3101 Kemp Rd., Dayton, Ohio 45431

Filed Aug. 30, 1979, Ser. No. 70,943
Int. Cl.[3] H01S *3/14*
U.S. Cl. 331—94.5 F **6 Claims**



1. An apparatus for generating a spatially coherent laser beam having concurrent CW and pulsed modes, comprising:

a. a gain medium;

b. a means for continuously pumping said medium;

c. a first reflective surface at a first end of said gain medium for optically terminating said gain medium, said first reflective surface having distinct areas for CW and pulsed operating modes;

d. a second reflective surface at a second end of said gain medium, in the form of an output coupling having distinct areas for CW and pulsed operating modes, said second reflective surface disposed oppositely to the said first reflective surface and defining an optical resonant cavity with said first reflective surface; and

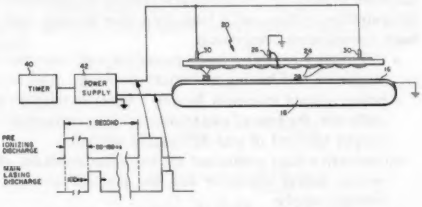
e. a transition material, at one of said ends of said gain medium, having selectively optically reflective and transmissive phases in response to an external stimulus.

4,287,483

TRANSVERSE EXCITATION LASER

Robert I. Rudko, Holliston, and James W. Barnie, Stoughton, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Sep. 4, 1979, Ser. No. 71,809
Int. Cl.[3] H01S *3/09*
U.S. Cl. 331—94.5 PE **10 Claims**



1. The method of operating a gaseous laser having a gaseous medium comprising carbon dioxide and helium excited by a discharge transverse to the optical path comprising the steps of:

providing an ionizing discharge in an elongated region adjacent to said optical path and between elongated electrodes positioned on either side of said optical path;

said ionizing discharge being produced between a plurality of copper elements to produce a range of temperatures extending from ambient to several hundred degrees and having a thin layer of copper oxide covering said elements;

producing a high current discharge between said electrodes to produce a lasing beam; and

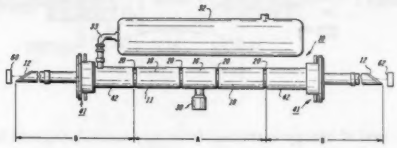
allowing a period of time to elapse to permit portions of the carbon dioxide gas which have broken down into constituent gases of carbon dioxide to reform into carbon dioxide by catalytic action of the copper oxide surface of said copper elements at elevated temperatures.

4,287,484

SEGMENTED HOLLOW CATHODE LASER DEVICE

Shing C. Wang, Temple City, and Randolph W. Hamerdinger, Glendora, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 2, 1978, Ser. No. 948,077
The portion of the term of this patent subsequent to Sep. 1, 1978, has been disclaimed.
Int. Cl.[3] H01S *3/03*
U.S. Cl. 331—94.5 G 15 Claims



1. A laser device for producing an output laser beam having a plurality of wavelengths comprising:

an envelope having a longitudinal axis,

an anode electrode forming a portion of said envelope, said anode electrode being coaxially disposed with respect to said longitudinal axis, at least two separate hollow cathodes located within said envelope, said hollow cathodes being coaxially disposed with respect to said longitudinal axis,

said hollow cathodes each having a portion thereof coupled to said envelope whereby the heat generated in said hollow cathodes is dissipated to the external environment,

coaxially aligned mirror end members, said mirror end members sealing said envelope thereby providing a resonant cavity and a structure for confining a gaseous medium therein,

means for supplying an active gaseous medium having an absorption band such that it will lase at wavelengths supported by said resonant cavity in said envelope, and

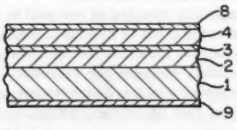
means for applying a voltage between said anode electrode and said hollow-cathodes whereby a discharge between said cathodes and said anode electrode is created causing said gaseous medium to lase, a laser output beam having a plurality of wavelengths thereby being produced, said output beam being abstracted from one of said mirror end members.

4,287,485

GAINASP/INP DOUBLE-HETEROSTRUCTURE LASERS

Jaw J. Hsieh, Burlington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 816,402, Jul. 18, 1977, abandoned, which is a continuation-in-part of Ser. No. 758,733, Jan. 12, 1977, abandoned. This application Apr. 30, 1979, Ser. No. 34,116
Int. Cl.[3] H01S *3/19*
U.S. Cl. 331—94.5 H 12 Claims



1. In a diode laser, the improvement wherein the diode comprises:

a. InP substrate;

b. a buffer layer of InP on said substrate;

c. an active layer of $Ga_xIn_{1-x}As_yP_{1-y}$ on said buffer InP layer, said active layer being substantially lattice-matched to said buffer layer and said active layer having a thickness of less than about 0.5 μm;

d. a barrier layer of InP on said active $Ga_xIn_{1-x}As_yP_{1-y}$ layer; and,

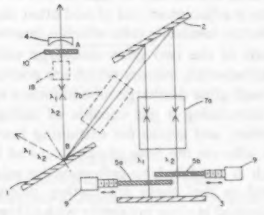
e. first and second ohmic contacts to said substrate and said barrier layer.

4,287,486

LASER RESONATOR CAVITIES WITH WAVELENGTH TUNING ARRANGEMENTS

Ali Javan, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 654,100, Feb. 2, 1976. This application May 14, 1979, Ser. No. 38,540
Int. Cl.[3] H01S *3/10*
U.S. Cl. 331—94.5 C 23 Claims



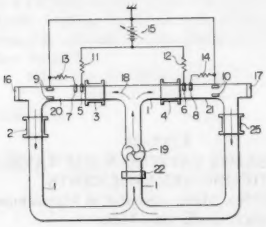
1. In a laser comprising an optical cavity defined by first and second reflecting optics, a first amplifying medium within the cavity and means to excite said medium to produce lasing conditions, said laser including means to restrict the laser beam to a common path for all wavelengths in the region of said first reflecting optics, the improvement comprising means including spectral dispersion apparatus disposed within the optical cavity, positioned to receive a beam of restricted cross section in said common path from said first reflecting optics and to disperse said beam to a plurality of paths in which rays of different wavelength are laterally spaced apart, said paths passing through said first amplifying medium whereby rays differing in wavelength can be subjected to amplification in different spatially separated portions of said first amplifying medium, said second reflecting optics constructed to reflect regeneratively said rays back along said paths, in laterally spaced apart condition through said portions of said first amplifying medium for further amplification, thence from said spectral dispersion apparatus along said common path to said first reflecting optics, said laser including a second amplifying medium disposed in the common beam path between said first reflecting optics and said spectral dispersion apparatus, in which path said rays are in a non-resolved, overlapping relation, and means to excite both said first and said second amplifying medium whereby a given wavelength amplified in a portion of said first amplifying medium can be present in said common beam path to cause excitation of laser oscillation at said wavelength in said second amplifying medium.

4,287,487

GAS LASER GENERATING DEVICE OF THE LONGITUDINAL GAS FLOW TYPE

Kouji Kuwabara; Hiroyuki Sugawara, both of Hitachi; Toshiharu Shirakura, Tokaimura; Kouji Sasaki, and Satoshi Takemori, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 26, 1979, Ser. No. 52,195
Claims priority, application Japan, Jun. 28, 1978, 53/77488
Int. Cl.[3] H01S *3/03*
U.S. Cl. 331—94.5 G **6 Claims**



1. A gas laser generating device of the longitudinal gas flow type having at least two glow discharge tubes, each of which has positive and negative electrodes and two ends wherein said discharge tubes are located so that an end of one of said discharge tubes is adjacent an end of said other discharge tube, at least one electric insulating tube which is inserted between said adjacent ends of the two glow discharge tubes in order to insulate therebetween, mirrors which are positioned at at least one end of each glow discharge tube to form a resonant cavity, means for circulating a gas capable of lasing through said discharge tubes, and means for extracting laser energy from said device, wherein the flow of gas is excited to generate gas lasing which is amplified by reflection by said mirrors, and characterized in that there are further provided triggering electrodes located in close proximity with either the positive or the negative electrodes of each of said two glow discharge tubes, respectively, which triggering electrodes are connected to the other of said positive or negative electrodes of said two glow discharge tubes which they are not in close proximity with through triggering resistors, respectively.

4,287,488

RF FEEDBACK FREE ELECTRON LASER

Charles A. Brau; Donald A. Swenson, and Thomas J. Boyd, Jr., all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 2, 1979, Ser. No. 90,846
Int. Cl.[3] H01S *3/09, 3/14*
U.S. Cl. 331—94.5 PE **8 Claims**

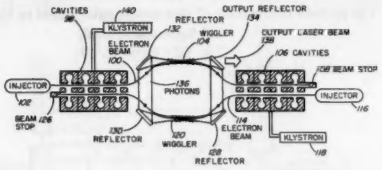
1. An electron beam energy system for a free electron laser comprising:

first cavity means for accelerating a first electron beam;

second cavity means for decelerating said first electron beam and extracting rf energy from said first electron beam;

third cavity means disposed adjacent said second cavity means, said third cavity means for accelerating a second electron beam in response to rf energy generated by said second cavity means by decelerating said first electron beam;

fourth cavity means for decelerating said second electron beam to extract rf energy from said second electron beam, said first cavity means disposed adjacent said fourth cavity means to accelerate said first electron beam in response to



said rf energy extracted from said second electron beam by said fourth cavity means;

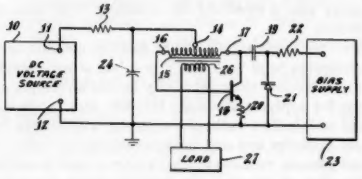
whereby deposition of said first cavity means adjacent said fourth cavity means and said third cavity means adjacent said second cavity means reduces rf feedthrough losses to enhance efficiency of said electron beam energy system.

4,287,489

AMPLITUDE LIMITED VARACTOR TUNED L-C OSCILLATOR

Clinton L. Pinkham, New Hartford, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Sep. 19, 1979, Ser. No. 77,129
Int. Cl.[3] H03B *5/12*
U.S. Cl. 331—117 R **6 Claims**



1. A tunable oscillator, comprising:

(a) a DC voltage source having first and second terminals;

(b) a transistor having an emitter electrode, a base electrode and a collector electrode;

(c) a resistor coupled at one end to the emitter electrode and at a second end to the second terminal of the voltage source;

(d) an inductor DC connected between the collector and base electrodes, the inductor having a tap between its ends, the tap being coupled to the first terminal of the voltage source to keep the collector and base electrodes at substantially the same DC potential;

(e) an AC by-pass capacitor coupling the tap to the second terminal of the voltage source; and

(f) a variable capacitor coupled at one end to the collector electrode and at the other of its ends to said second end of the resistor, whereby the oscillator operates with a peak to peak AC potential, between the collector electrode and the second terminal, which is limited to substantially twice the forward bias base to emitter voltage of the transistor.

4,287,490

Patent Not Issued For This Number

4,287,491

CIRCUIT FOR SELECTIVELY OBTAINING AUTOMATIC DYNAMIC COMPRESSION OR EXPANSION

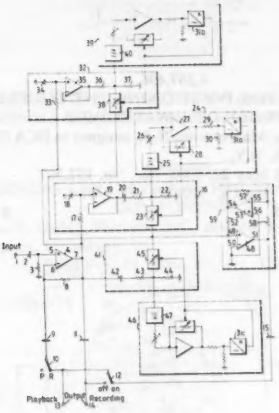
Werner Scholz, Gehrden, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 21, 1979, Ser. No. 106,160

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2856045

Int. Cl.³ H03H *11/36*; H04B *1/64*

U.S. Cl. 333—14 5 Claims



1. A circuit, having an input terminal and first and second output terminals, for selectively compressing or expanding a signal having frequency components within a given frequency spectrum, comprising:

amplifier means having first and second inputs and an output, said first input being coupled to said input terminal and said output to said first output terminal;

a summing circuit having an input and an output, the output of said summing circuit being coupled to the second input of said amplifier means when said signal is being compressed and to said second output terminal when said signal is being expanded, the compressed signal being obtained at said first output terminal; and

a plurality of frequency selective channels each capable of transmitting signals having frequencies within a predetermined portion of said frequency spectrum, coupled in parallel between the output of said amplifier means and the input of said summing circuit, one of said frequency selective channels being adapted for transmitting signals in the high frequency range of said frequency spectrum and consisting of only a passive filter and an associated variable impedance, the remaining frequency selective channels each including a passive filter, variable impedance and an impedance converter.

4,287,492

CONCENTRATED CONSTANT TYPE DELAY DEVICE

Yoshio Goshima, and Hisashi Osada, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1979, Ser. No. 69,541

Int. Cl.³ H03H *7/32*

U.S. Cl. 333—140 4 Claims

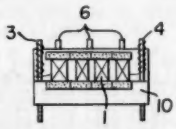
1. A concentrated constant type delay device comprising:

a substrate;

an input terminal, an output terminal and a common terminal mounted on said substrate;

a plurality of coils connected in series between said input terminal and said output terminal and having a joint between adjacent coils;

a plurality of capacitors, equal in number to the number of said joints, each connected between said common terminal and a different one of said joints;



wherein said plurality of capacitors is formed as a composite capacitor having a dielectric with a common electrode on one surface and a plurality of separated electrodes on the opposite surface, said common electrode having two leads extending therefrom in one direction and said separated electrodes each having one lead extending therefrom in the said one direction and each of said leads of said separated electrodes being connected to a joint;

wherein one of said leads of said common electrode is passed through said substrate to form said common terminal.

4,287,493

PIEZOELECTRIC FILTER

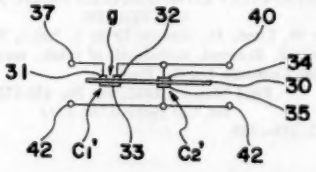
Kimio Masaie, Kanazawa, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Jan. 21, 1980, Ser. No. 113,449

Claims priority, application Japan, Jan. 25, 1979, 54-7869; Aug. 7, 1979, 54-100985

Int. Cl.³ H03H *9/205, 9/56, 9/60*

U.S. Cl. 333—191 7 Claims



1. A piezoelectric filter, comprising:

a piezoelectric substrate having first and second main surfaces;

electrode means disposed on said main surfaces and defining at least one set of piezoelectric resonators, said set including an energy-trapping multi-mode resonator and a thickness-vibration, energy-trapping type single resonator; and

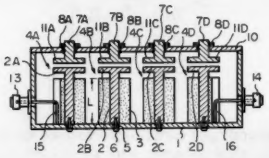
conductive means disposed on said main surfaces of said substrate defining an input terminal, an output terminal and a third terminal and defining conductive paths connecting said energy-trapping multi-mode resonator in series between said input terminal and said output terminal, and connecting said thickness-vibration energy-trapping type single resonator between said third terminal and one of said input terminal and said output terminal.

4,287,494

DISTRIBUTED CONSTANT TYPE FILTER

Tadashi Hashimoto, Ichikawa, and Katsuya Jindou, Kamagaya, both of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Apr. 17, 1980, Ser. No. 141,230
Claims priority, application Japan, Apr. 27, 1979, 54-51492
Int. Cl.³ H01P *1/205, 7/06, 7/04*
U.S. Cl. 333—202 **3 Claims**



1. A filter comprising a conductive closed housing having a bottom wall, an upper wall, and side walls between said bottom wall and the upper wall, a plurality of resonators fixed on a straight line on the bottom wall inside of the housing, one end of each resonator being grounded to the bottom wall and the other end of each resonator being free standing, each resonator having at least an elongated center conductor and a dielectric body covering the center conductor at least partially in the longitudinal direction of the center conductor, a pair of connectors mounted at the opposite ends at the side walls for coupling the filter with an external circuit, a pair of loops each connected to the inner conductor of said connector and one end of the loops being grounded to the bottom wall, characterized in that a pair of confronting conductive disks is provided between the free standing end of a each center conductor of a resonator and the upper wall to provide the capacitance between said free standing end and the upper wall, and the length L of the dielectric body covering the center conductor satisfies;

$$L \leqq \lambda_0/5\sqrt{\epsilon_e}$$

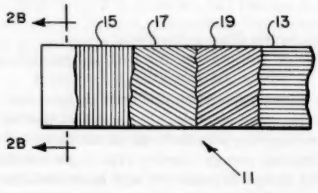
where λ_0 is the wavelength in the free space of the center frequency of the filter, and ϵ_e is the effective dielectric constant of the dielectric body.

4,287,495

THERMALLY COMPENSATED PHASE-STABLE WAVEGUIDE

Walter W. Lund, Jr., Seattle; Ervin J. Nalos, Bellevue, and Donald E. Skoumal, Auburn, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 31, 1980, Ser. No. 135,873
Int. Cl.³ H01P *1/30, 3/12*
U.S. Cl. 333—239 **9 Claims**



1. A phase-stable, temperature-compensated waveguide comprising:

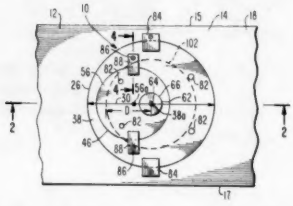
laminate element means formed into a waveguide configuration, said laminate element means comprising a plurality of successive plies of fibrous composite material, one ply having its fiber content aligned generally parallel to the longitudinal dimension of the waveguide, a second ply having its fiber content aligned generally parallel to the transverse dimension of the waveguide, and a first set of third and fourth plies having their fiber content oriented at selected angles relative to the longitudinal dimension of the waveguide, such that the transverse dimension of the waveguide changes sufficiently relative to a change in the longitudinal dimension of the waveguide due to temperature change that the phase of the signal exiting from the waveguide does not change in response to temperature.

4,287,496

ASSEMBLY FOR POSITIONING THE COUPLING PROBE OF A WAVEGUIDE

William C. Young, Moorestown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 22, 1980, Ser. No. 152,307
Int. Cl.³ H01P *1/00, 5/04*
U.S. Cl. 333—248 **8 Claims**



1. An assembly for positioning a coupling probe within a waveguide having a pair of opposing walls, one of the walls being formed with a circular aperture therein, said assembly comprising:

a first circular cylinder-like member rotatably positioned in said aperture in said wall about a first axis comprising the central axis of said first member; and

means adapted to receive said coupling probe therethrough in a position offset from the central axis of said means, and rotatably positioned in said first cylinder-like member about a second axis displaced from the first axis, for positioning said coupling probe within said waveguide, said second axis comprising said central axis of said means.

4,287,497

INTEGRATED UNIVERSAL RF JOINT AND GIMBAL SYSTEM

Robert A. Johnson, Tempe, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Jun. 12, 1979, Ser. No. 47,832
Int. Cl.³ H01P *1/06, 5/08*
U.S. Cl. 333—261 **10 Claims**

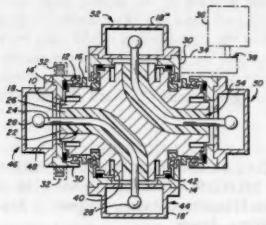
1. An integral universal joint for transmission of radio frequency energy comprising in combination:

a first rotary radio frequency joint;

a second rotary radio frequency joint; and

a coaxial transmission line, said first and second rotary radio frequency joints each having a rotational axis, each of said axes being substantially orthogonal to the other, said coaxial transmission line having two ends thereof, each of said ends having a radio frequency transition to a wave-

guide of one of said first and second rotary radio frequency joints wherein one of said waveguides is a first



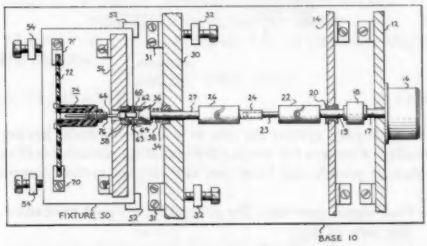
terminal of the universal joint and a second of said waveguides is a second terminal of the universal joint.

4,287,498

TUNING ARRANGEMENT FOR ELECTRICAL COMPONENTS

Thomas W. Gaddy, Florence, S.C., assignor to General Electric Company, Lynchburg, Va.

Filed Feb. 19, 1980, Ser. No. 123,104
Int. Cl.³ H03J *1/06*
U.S. Cl. 334—74 **14 Claims**



1. An improved arrangement for mechanically tuning electrical components positioned on a chassis, each of said electrical components having a rotatable member which, when rotated, changes the characteristic of its respective component, said arrangement comprising:

a. a base structure;

b. first means positioned on said base structure for receiving and holding said chassis;

c. a tool template positioned on said base structure adjacent said first means, said tool template including at least one bearing having an opening therethrough positioned at a location corresponding to the location of an electrical component on said chassis;

d. an elongated tuning tool having an engaging element at one end for engaging the rotatable member of said electrical component, and having a receptacle at the other end for receiving a rotator;

e. said tuning tool being adapted to be positioned in said opening of said bearing with said engaging element positioned on one side of said tool template for engagement with said rotatable member of said electrical component, and with said receptacle positioned on a second side of said tool template opposite said one side;

f. a rotator template positioned on said base structure adjacent said second side of said tool template, said rotator template having a bearing positioned at a location corresponding to the location of said bearing on said tool template, and a rotator positioned in said bearing on said rotator template on the side thereof adjacent said tool template for engaging said receptacle;

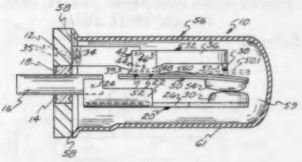
g. and second means positioned on said base structure for rotating said rotator on said rotator template.

4,287,499

CURRENT INTERRUPTING APPARATUS HAVING IMPROVED CONTACT LIFE

Radi Pejouhy, Marshfield, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 29, 1978, Ser. No. 974,454
Int. Cl.³ H01H *61/00*
U.S. Cl. 337—97 **14 Claims**



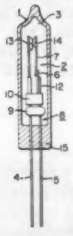
1. Electric current interrupting apparatus adapted for use with a selected impressed voltage level comprising a hermetically sealed housing, first and second electrically conductive contacts disposed in the housing, the contacts being movable relative to one another into and out of engagement with one another, means to cause such relative movement upon the occurrence of a selected condition, electrically conductive terminal means connected to the contacts and connectable to a source of power, and an atmosphere within the housing consisting essentially of a gas having a dielectric strength of between one half and one fifth of the dielectric strength of a nitrogen backfilled atmosphere at one atmosphere of pressure.

4,287,500

THERMAL PROTECTOR

Kensaku Ueda, Takatsuki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 2, 1979, Ser. No. 53,996
Claims priority, application Japan, Jul. 7, 1978, 53/94072[U]
Int. Cl.³ H01H *61/02, 63/013, 71/16*
U.S. Cl. 337—107 **6 Claims**



1. A thermal protector which comprises:

a heat responsive resistor, with a positive thermal coefficient, having two holes extending therethrough, two electrically conductive sleeves inserted into said holes in intimate contact with said heat responsive resistor, a stationary electrode having a lead extending through one of said sleeves in intimate contact with said sleeve, a movable electrode hav[illegible]; a heat responsive element disposed in opposed relationship to said stationary electrode and adapted to move away from said stationary electrode and open contact between said electrodes when the enviromental temperature reaches a predetermined level, said movable electrode having a lead extending through said

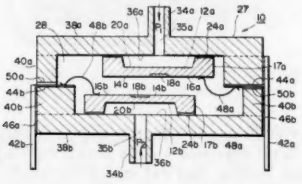
second sleeve in intimate contact with said second sleeve, said electrodes and heat responsive resistor being disposed within an air tight sealed envelope having the leads extending therefrom.

4,287,501

PRESSURE SENSOR

Tamotsu Tominaga; Teruyoshi Mihara, both of Yokohama; Takeshi Oguro, Yokosuka, and Masami Takeuchi, Kokubunji, all of Japan, assignors to Nissan Motor Company, Limited, Kawagawa, Japan

Filed Jan. 4, 1980, Ser. No. 109,484
Claims priority, application Japan, Jan. 31, 1979, 54-10009[U]
Int. Cl.³ H01L *10/10*
U.S. Cl. 338—42 **5 Claims**



1. A differential pressure sensor comprising:

two parts which are substantially identical to each other and each of which comprises a half-casing in which is formed at least one aperture adapted to admit a fluid pressure, at least one diaphragm disposed adjacent to one said aperture in such a manner that a fluid pressure introduced through the aperture may be applied to one side of the diaphragm, and at least one diffused resistor formed as a pressure-sensitive element on an inner surface of the diaphragm opposite to the side to which a fluid pressure is applied; and

connection means for electrically connecting the diffused resistors to an electric circuit;

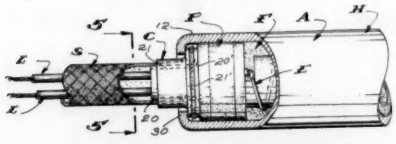
wherein the two substantially identical parts are joined together to form a package which is sealed, and which encloses a space which is evacuated.

4,287,502

CARTRIDGE HEATER STRUCTURE

Walter V. Nickmeyer, Redlands, Calif., assignor to Amark Industries, Inc., San Jacinto, Calif.

Filed Jun. 19, 1979, Ser. No. 49,877
Int. Cl.³ H01C *1/02*
U.S. Cl. 338—274 **16 Claims**



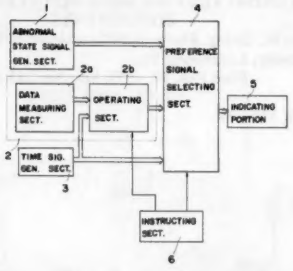
1. A cartridge heater structure comprising an elongate cylindrical metal case with front and rear ends, an elongate heater element supported within the case, a plug of dielectric material within at least the rear portion of the case axially forward of the rear end of the case, elongate flexible jacketed power lines with front end portions extending through the plug and electrically connected with said element and rear end portions extending rearwardly from the case, an elongate tubular flexible braided metal sheath with front and rear ends engaged about and extending longitudinally of the lines and a coupling structure coupling the front end of the sheath with the rear end of the case, said coupling structure including an elongate axially extending inner tube part freely engaged about the lines and within the front portion of the sheath, an elongate axially extending outer tube part engaged about the inner tube part with a forward portion of the sheath held securely therebetween, one tube part has a radially outwardly projecting flange arranged within the rear portion of the case between the rear end of the case and the plug and retaining means between the rear end portion of the case and said flange retaining the flange in the case and against axial rearward displacement therefrom.

4,287,503

RUNNING DATA CENTRAL DISPLAY ARRANGEMENT FOR MOTOR VEHICLES AND THE LIKE

Shizuo Sumida, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Oct. 11, 1978, Ser. No. 950,519
Claims priority, application Japan, Oct. 13, 1977, 52/123343
Int. Cl.³ G08B *19/00*
U.S. Cl. 340—52 F **4 Claims**



1. A display system for use in a motor vehicle having a plurality of sensors for sensing the operating perameters of said vehicle at preselected locations, said display system comprising:

a time signal generator for generating a signal indicative of the time of day;

a measured data signal generator for receiving the output of at least some of said plurality of sensors and for performing arithmetic manipulation of said outputs of said sensors to generate signals corresponding to predetermined parameters of said motor vehicle, said measured data signal generator including a multiplexer means for selecting one of said outputs of said measured data signal generator in response to a multiplex control signal;

an abnormal state signal generator operatively connected to at least some of said plurality of sensors and to said measured data signal generator for generating a signal when the output of at least one of said sensors is outside its respective predetermined range and for generating a signal when at least one of the outputs of said measured data signal generator is outside its respective predetermined range, said abnormal state signal generator simultaneously generating a code signal corresponding to the sensor having an output outside said respective predetermined range and simultaneously generating a code signal corresponding to said output of said measured data signal generator having an output outside said respective predetermined range;

a preference signal selecting unit operatively connected to said time signal generator, said measured data signal generator, and said abnormal state signal generator for selectively gating, as its output, the output of one of said time signal generator, measured data signal generator, and abnormal state signal generator;

a display unit responsive to the selectively gated output of the preference signal selecting unit;

a manual operator control means operatively connected to

said measured data signal generator and said preference signal selecting unit for controlling said multiplexer to control the output of said measured data signal generator inputted to said preference signal selecting unit; wherein said preference signal selecting unit comprises signal selecting means for enabling the display unit to display the output of said abnormal state signal generator when said abnormal state signal generator produces an output, for enabling the display unit to display the output of said measured data signal generator under the simultaneous occurrence of the absence of an output from said abnormal state signal generator and a manually entered control input in said manual input means, and for enabling said display unit to display the output of said time signal generator under the simultaneous occurrence of the absence of outputs from said abnormal state generator and said measured data signal generator.

4,287,504
WARNING DEVICE WITH CENTRAL INDICATION OF OPERATING CONDITIONS TO BE MONITORED IN MOTOR VEHICLES

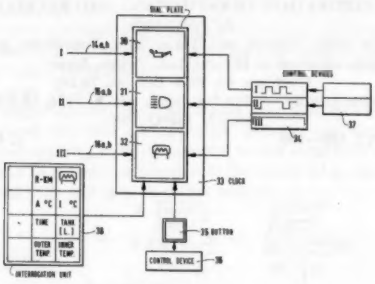
Ernst-Ulrich Simon, Oberursel, and Horst Ullrich, Schöneck, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 7, 1979, Ser. No. 46,598

Claims priority, application Fed. Rep. of Germany, May 16, 1978, 2821344

Int. Cl.³ G08B *19/00*

U.S. Cl. 340—52 F **10 Claims**



1. A warning device with central indication of operating conditions to be monitored in motor vehicles having an analog time clock with an instrument dial of the clock, and with an indicator device which is controllable by a monitoring device, comprising

an indicator device being arranged in the analog time clock, the instrument dial at several positions being translucent with designations applied at said positions of the monitored operating conditions,

a monitoring means for controlling illumination of the translucent positions from a rear side of the instrument dial so that said designations visibly stand out from its surroundings, whereby information to be indicated is readable from the instrument dial, said indicator display includes at least one field including a light surface means for signaling a trouble situation, indicator surface means for the designation of the respective operating condition at the time as well as a numeral surface, the latter constituting means for representation of the number of simultaneously occurring trouble operating conditions.

4,287,505
TROUBLE DIAGNOSING DEVICE OF CONTROL CIRCUIT SYSTEM

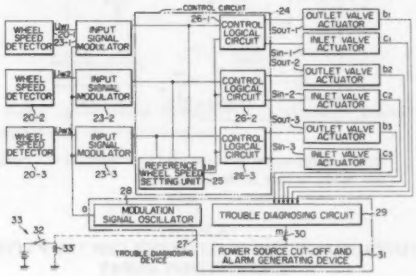
Taiji Ohmori, Kawagoe; Makoto Sato, Kamifukuoka, and Yoshikazu Tsuchiya, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1979, Ser. No. 58,376

Claims priority, application Japan, Jul. 21, 1978, 53-89266; Feb. 19, 1979, 54-18082

Int. Cl.³ B60T *17/22*

U.S. Cl. 340—52 B **10 Claims**



1. In a control system, a trouble diagnosing device for diagnosing trouble in a control circuit or in an actuator wherein said control circuit receives an input signal representative of information about a controlled means which is controlled by the actuator and transmits controlling indicia to the actuator for controlling the operation of the controlled means; said trouble diagnosing device comprising:

a modulation signal means for feeding to the input side of the control circuit a trouble diagnosing signal having such a narrow pulse width that the actuator is not able to respond thereto, said trouble diagnosis signal being independent of the input signal related to the controlled means;

input signal modulator means for modulating the input signal related to the controlled means by the trouble diagnosing signal to produce a modulation signal; and

a trouble diagnosing circuit means for producing output signals indicating trouble in the control circuit or in the actuator when the control circuit or the actuator receives the modulation signal from said input signal modulator and in response thereto emits a signal having other than a predetermined waveform.

4,287,506
VOLTAGE GENERATOR WITH SELF-CONTAINED PERFORMANCE MONITOR

Gerald P. Richards, Framingham, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 22, 1978, Ser. No. 972,311

Int. Cl.³ H01J *29/56*; H04N *9/24*

U.S. Cl. 340—146.3 R **13 Claims**

1. A computer driven system having a performance monitoring circuit comprising:

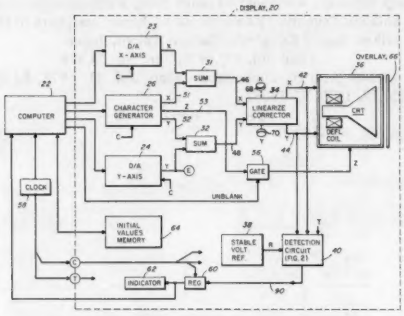
means for generating random coordinate position signals;

a source of reference signals;

means for comparing a predetermined set of said coordinate position signals with said reference signals during a first and second interval of time, said comparing means sensing the relative magnitudes of said coordinate position signals and said reference signals; and

means for detecting drift greater than a predetermined

amount in said predetermined set of coordinate position signals as a function of a change in the relative magnitudes



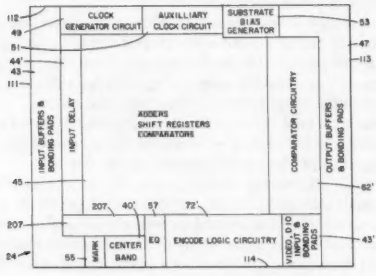
from a comparison made in said first interval to a comparison made in said second interval.

4,287,507

TOPOGRAPHY FOR INTEGRATED CIRCUIT PATTERN RECOGNITION ARRAY

Michael M. Janes, Colorado Springs, and Rodney H. Orgill, Woodland Park, both of Colo., assignors to NCR Corporation, Dayton, Ohio

Filed May 30, 1979, Ser. No. 43,929
Int. Cl.[3] G06K 7/14
U.S. Cl. 340—146.3 Z **7 Claims**



1. An integrated circuit for sequentially receiving a plurality of binary interval numbers each representing the width of a time interval occurring during optical scanning of a bar coded label, the integrated circuit receiving a plurality of signals each representing whether a respective one of the time intervals is a bar or a space, said integrated circuit comprising in combination:

a. first means for receiving and storing said binary interval numbers;

b. second means for adding predetermined ones of said stored binary interval numbers and storing the resulting sums;

c. third means responsive to said first and second means for comparing predetermined ones of said sums and said stored resulting sums to produce a plurality of intermediate logic signals;

d. fourth means responsive to said third means for encoding predetermined ones of said intermediate logic signals to produce a digital character number representing a character scanned on the bar encoded label; and

e. output means for outputting said digital character number;

said integrated circuit having first, second, third and fourth sequentially located edges, said first means being located substantially closer to said first edge than to said third edge to reduce lengths of conductors conducting signals representing said binary interval numbers from respective input pads which are located along said first edge, said third means being located substantially closer to said third edge than to said first edge, said second means being located generally between said first means and said third means to reduce capacitances of clock signal conductors which are distributed through said second means,

said fourth means being located substantially closer to said fourth edge than to said second edge to reduce the lengths of said second and fourth edges, wherein said first means includes a plurality of bonding pads and input buffer means for receiving said binary interval numbers and first delay means coupled to said input buffer means for temporarily storing and delaying binary interval numbers received by said bonding pads, said first delay means being located between said input buffer means and said second means immediately adjacent to said input buffer means in order to avoid degradation of voltage of input signals transmitted from said input buffer means to said delay means,

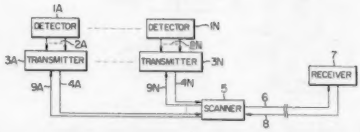
said integrated circuit including clock signal generating means for producing clock signals to be distributed to various portions of said integrated circuit and a metal power bus connected to a bonding pad, said metal power bus extending from a location adjacent to said first edge through said first means to said second means between upper and lower portions of said power means, said clock signals being conducted on metal conductors and diffused crossunders which pass beneath the portion of said metal power bus extending through said first means, the placement of said portion of said metal power bus extending through said first means being selected to avoid delay of certain of said clock signals to circuitry in each upper portion of said first means.

4,287,508

INFORMATION TRANSMITTING AND RECEIVING APPARATUS

Setsuo Arita, Hitachi, and Takao Sato, Tokaimura, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 10, 1979, Ser. No. 74,146
Claims priority, application Japan, Sep. 8, 1978, 53-109748
Int. Cl.[3] H04Q 9/00
U.S. Cl. 340—150 **12 Claims**



1. An information receiving apparatus for receiving information in the form of sets of sequentially-transmitted information signals, each information signal including synchronizing signal, address signal and data signal portions and representing a segment of an information set, comprising

first means for storing the data signal portion of a currently-received information signal;

second means for separately storing the data signal portions of the previously-received information signals of the immediately-preceding information set;

third means connected to said first means for comparing the data signal portion stored in said first means with a data signal portion stored in said second means;

fourth means responsive to the synchronizing signal portions of said received information signals for reading out to said third means the stored data signal portion in said second means which corresponds to the same segment within an information set as the data signal portion stored in said first means; and

fifth means responsive to said third means for providing a retransmission command signal when lack of comparison between data signal portions is detected by said third means.

4,287,509

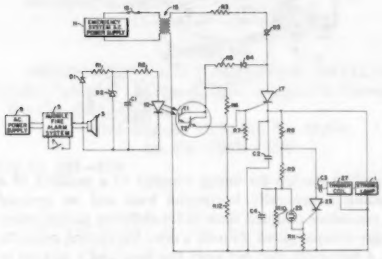
SOUND AND LIGHT SIGNALING SYSTEM

Daniel H. Beggs, 191 Dickinson St., Rochester, N.Y. 14621

Filed Mar. 26, 1979, Ser. No. 23,538

Int. Cl.[3] G08B *7/00*

U.S. Cl. 340—326 **4 Claims**



1. In a signaling system of the type adapted to produce audible signals in the event of emergency conditions, the improvement comprising:

(a) an opto-electronic isolator for sensing at one location the application of power to the audible signaling system and for providing an output signal in response thereto at a second location physically separated from the audible signaling system;

(b) at least one high intensity lamp of the type producing illumination of such intensity and duration so as to excite the human optic senses;

(c) a source of potential; and

(d) a trigger circuit connected to said lamp, said source of potential and said opto-electronic isolator, said trigger circuit applying enabling potential to said lamp from said source of potential in response to the receipt of an output signal from said opto-electronic isolator.

4,287,510

ELECTRONIC SIGNAL GENERATOR WITH PERIODICALLY VARYING FREQUENCY

Martin Siegwarth, Esslingen, Fed. Rep. of Germany, assignor to Richard Hirschmann Radiotechnisches Werk, Esslingen, Fed. Rep. of Germany

Filed Dec. 3, 1979, Ser. No. 99,894

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1978, 2852196

Int. Cl.[3] G08B *3/00*

U.S. Cl. 340—384 E **12 Claims**

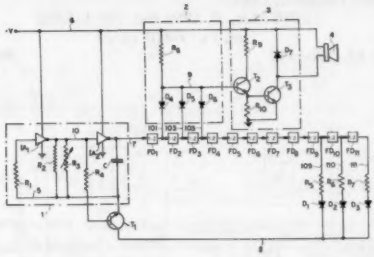
1. A signal generator comprising:

an oscillator provided with electronically adjustable tuning means for varying the operating frequency thereof;

frequency-dividing means connected to said oscillator for generating on an output terminal thereof a periodically varying control signal subharmonically related to said operating frequency;

feedback means extending from said output terminal to said tuning means for periodically modifying said operating frequency in response to said control signal; and

a load circuit connected to said oscillator in parallel with at least part of said frequency-dividing means for tapping off



a useful signal whose frequency is substantially higher than that of said control signal.

4,287,511

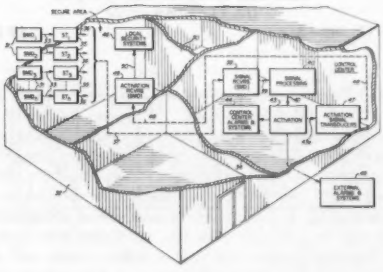
INTRUSION ALARM SYSTEM UTILIZING STRUCTURAL MOMENT DETECTOR AS INTRUSION SENSOR AND AS RECEIVER FOR MECHANICAL INTRUSION AND COMMAND SIGNALS

David R. Scott, Lancaster, Calif., and Thomas S. Rhoades, Colorado Springs, Colo., assignors to Scott Science and Technology, Inc., Lancaster, Calif.

Filed Oct. 22, 1979, Ser. No. 86,772

Int. Cl.[3] G08B *13/10*

U.S. Cl. 340—541 **4 Claims**



1. An intrusion alarm-security system for detecting unauthorized entry of persons into a defined secure area within a building structure, for generating and transmitting signals responsive to such intrusion and for activating security systems in response to such intrusion signals, said system comprising:

(a) at least one structural moment detector carried by a structural member of said building, located within said secure area, said structural moment detector generating intrusion signals responsive to the deflection of said structural member induced by changes of the loading on said member caused by an intrusion and being insensitive to linear distortions of said member;

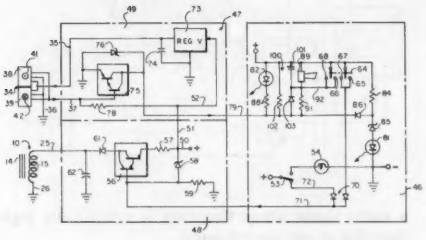
(b) means for transmitting said intrusion signals to a control center; and

(c) means in said control center for receiving said intrusion signals and for generating security system activation signals in response thereto.

4,287,512
MAGNETIC LOCKING METHODS AND APPARATUS

C. Marlon Combs, Claremont, Calif., assignor to Dynametric, Inc., Pasadena, Calif.

Filed Mar. 31, 1980, Ser. No. 136,012
Int. Cl.[3] G08B *13/22*
U.S. Cl. 340—542 30 Claims



15. In apparatus for operating a magnetic locking assembly having matching first and second magnetizable components, the improvement comprising in combination:

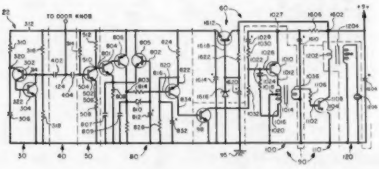
means for magnetically attracting said first and second components into mating relationship whereby a predetermined magnetic flux is established in one of said components; and

means coupled to said attracting means for monitoring said established predetermined flux to detect locking power diminutions between said components.

4,287,513
DOOR KNOB ALARM DEVICE

Hau C. Lam; Thomas K. P. Lee, and Y. C. Cheng, all of Kowloon, Hong Kong, assignors to International Quartz Ltd., Kowloon, Hong Kong

Filed May 3, 1979, Ser. No. 35,721
Int. Cl.[3] G08B *13/22*
U.S. Cl. 340—562 19 Claims

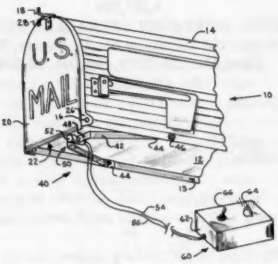


1. A doorknob alarm device comprising a body, means for hanging said device from a doorknob, electronic circuit means within said body including an oscillator circuit, a capacitance network coupled to the output of said oscillator circuit, an amplifier circuit coupled to the output of said capacitance network, means for electrically coupling said capacitance network to the doorknob so as to form an input to said electronic circuit means, self-initializing and self-compensating, oscillatory signal level detecting circuit means without manual sensitivity adjustment coupled to the output of said amplifier for detecting drops in the signal level from said amplifier such as would be caused by the addition of capacitance to said capacitance network when someone's hand comes close to or touches the doorknob on which said device is hung, an alarm circuit coupled to the output of said signal level detecting circuit, said alarm circuit being triggered by said signal level detecting circuit and a regulated D.C. power supply for supplying voltage to said electronic circuit means.

4,287,514
MAILBOX ANNOUNCER

Carl E. Wartman, 29 Colonial Dr., Cocoa Beach, Fla. 32931, and George Dussich, 7007 N. Atlantic Ave., Suite 207, Cape Canaveral, Fla. 32920

Filed Apr. 16, 1980, Ser. No. 140,725
Int. Cl.[3] G08B *21/00*
U.S. Cl. 340—569 8 Claims



1. A signaling device for being coupled to a mailbox of a type including a generally horizontal base and an upward extending container coupled thereto for defining an entryway and a storage compartment therein, a door for closing over the entryway, a hinge coupled between the base and a section of the door above a lower edge thereof so as to define a lower cantilevered tongue section of the door which rotates toward the base as the door is opened, said signaling device comprising in combination:

switch means mounted adjacent a lower surface of the base and adjacent to the tongue section of the door for generating a first signal responsive to operative communication with the tongue section of the door as the door is opened;

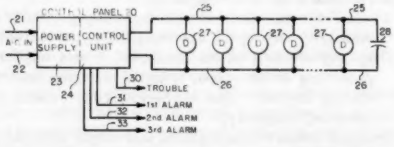
a U-shaped bracket having said switch means coupled to a central deformable section thereof and further having distended ends thereof coupled to the base for support, said central deformable section of said U-shaped bracket being flexible in order to deform responsive to an additional opening displacement of the door beyond that displacement necessary in order to actuate said switch means, whereby said switch means may be located immediately adjacent to the tongue section of the door for sensing small displacements thereof without being damaged by unexpectedly large displacements of the door; and

electrical signal means coupled to said switch means for generating a sensory perceptible signal responsive to receiving said first signal.

4,287,515
FIRE DETECTION SYSTEM WITH MULTIPLE OUTPUT SIGNALS

Samuel Raber, Allendale; John M. Wynne, Oak Ridge, and Alan M. Heim, Florham Park, all of N.J., assignors to Baker Industries, Inc., Parsippany, N.J.

Filed Apr. 27, 1979, Ser. No. 33,777
Int. Cl.[3] G08B *17/06*
U.S. Cl. 340—584 9 Claims



1. A fire detection system comprising:

a control unit for providing an energizing potential difference;

a pair of conductors connected to receive the energizing potential difference from the control unit;

a plurality of fire detectors, each connected in parallel across said conductor pair, and each of which signals an alarm in the same manner, by presenting a low impedance across said conductor pair; and

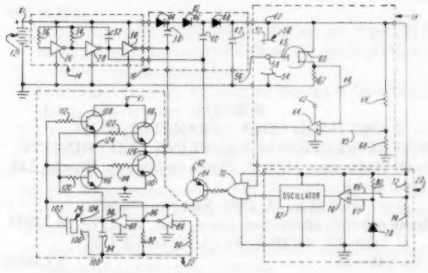
circuit means in said control unit, coupled to said conductor pair to receive status information from the detectors over the same conductor pair which supplies the energizing potential difference to the detectors, which control unit is effective to provide a first alarm output signal when a first one of the detectors is alarmed, and to provide a second alarm output signal when any of the remaining detectors is subsequently alarmed.

4,287,516

MINIMAL ENERGY DISSIPATING DETECTOR

Charles Coleman, Lakewood, Colo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 23, 1979, Ser. No. 68,936
Int. Cl.³ G08B *17/10*
U.S. Cl. 340—629 **8 Claims**



1. A combustion products detection apparatus having a load which minimizes the amount of energy required for proper operation by controlling the magnitude of power delivered to the load of the apparatus, said apparatus comprising:

a source of power;

means for detecting the presence of a predetermined concentration of combustion products;

first power supplying means connected to said power source and said detecting means for delivering power to the load of the apparatus when the predetermined concentration of combustion products is not present, said first power supplying means including oscillator means for outputting a signal having a first predetermined frequency; and

second power supplying means responsive to said detecting means when the predetermined concentration of combustion products is present, said second power supplying means increasing the power supplied to the load of the apparatus when the predetermined concentration of combustion products is present, said second power supplying means outputting a signal having a second predetermined frequency.

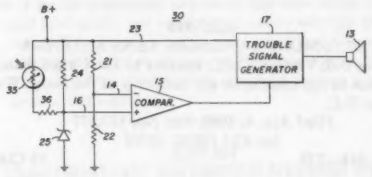
4,287,517

CIRCUIT FOR ELIMINATING LOW BATTERY VOLTAGE ALARM SIGNAL AT NIGHT

Richard A. Nagel, West Chicago, Ill., assignor to Pittway Corporation, Aurora, Ill.

Filed Jan. 25, 1980, Ser. No. 115,606
Int. Cl.³ G08B *21/00, 17/10*
U.S. Cl. 340—636 **13 Claims**

1. In a battery voltage alarm circuit including means for comparing a first signal which is a function of the battery voltage to a relatively fixed reference signal and indicating means for providing an alarm output when the first signal is less than the reference signal to indicate low battery voltage,



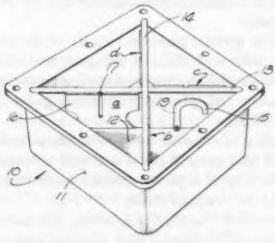
the improvement comprising condition-responsive control means for automatically shifting the level of one of the first and reference signals for varying the difference therebetween thereby to vary the time at which the alarm output can occur.

4,287,518

CAVITY-BACKED, MICRO-STRIP DIPOLE ANTENNA ARRAY

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Haynes Ellis, Jr., Chino, Calif.

Filed Apr. 30, 1980, Ser. No. 145,206
Int. Cl.³ H01Q *1/38*
U.S. Cl. 343—700 MS **12 Claims**



1. An antenna system particularly adapted for mounting flush with the skin surface of a reentrant air/space vehicle, to generate selectable sum and difference, circularly polarized radiation patterns from an aperture substantially flush with said skin surface comprising: a conductive cavity of substantially square cross-section in a plane parallel to said skin surface and of uniform depth internal to said vehicle, said cavity providing an aperture substantially at said flush mounting at said skin surface; first means within said cavity comprising a pair of dielectric boards each in a plane normal to said cavity cross-sectional plane, said boards each fitting between opposite corners of said cavity and intersecting orthogonally substantially at the center of said cavity; second means comprising a plurality of printed circuit dipoles, located two to the broad surface of each of said boards, one on either side of said board intersection; third means comprising a printed circuit feed trace on the opposite side of said dielectric board from each said dipoles, said traces each feeding a corresponding dipole through said board dielectric; fourth means comprising an external connection for each of said feeds to facilitate independent excitation control for each of said dipoles; and fifth means comprising a first four-port hybrid connected from two orthogonally adjacent dipole feeds of said third means to provide a first combined signal, a second four-port hybrid connected from the two remaining dipole feeds of said third means to produce a second combined signal, and a four-port comparator hybrid connected discretely at two of its ports to said first and second combined signals, said comparator hybrid also having

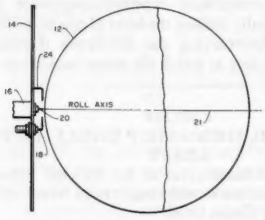
Σ and Δ ports such that selective excitation of one of said Σ and Δ ports produces a corresponding antenna pattern.

4,287,519

MULTI-MODE LUNEBERG LENS ANTENNA

Kazumasa Doi, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 4, 1980, Ser. No. 137,177
Int. Cl.³ H01Q *19/06*
U.S. Cl. 343—725 **15 Claims**



1. A multi-mode microwave lens antenna system using a common aperture for use in transmitting and receiving microwave radiation substantially in the direction of the antenna roll axis, comprising:

(a) a metallic ground plane having its center on the antenna roll axis with said roll axis being normal thereto;

(b) a microwave lens mounted with its primary axis along the antenna roll axis with its focal point close to said ground plane;

(c) a plurality of separate antenna feeds mounted about the center of said ground plane and said antenna roll axis;

(d) said plurality of separate antenna feeds including at least two bent-stub coaxial feeds;

(e) said bent-stub coaxial feeds having the ends thereof bent at an angle of 90 degrees with the bent ends being parallel to said ground plane at a selected distance in wavelength above said ground plane; the length of said bent ends being a desired dimension in wavelength;

(f) said bent-stub coaxial feeds being oriented such that the bent ends thereof point at the antenna roll axis;

(g) the orientation and position of said antenna feeds being operable to direct both horizontally-polarized and vertically-polarized antenna radiation through said microwave lens in the general direction of said antenna roll axis;

(h) said microwave lens being operable to focus microwave transmissions to and from said antenna feeds to provide antenna performance with high gain and narrow bandwidth.

4,287,520

SLOT CHEVRON ELEMENT FOR PERIODIC ANTENNAS AND RADOMES

Robert M. Van Vliet, Greene County, Ohio, and William R. Bushelle, St. Charles, Mo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

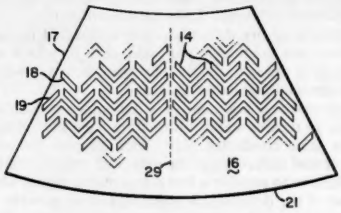
Filed Nov. 9, 1979, Ser. No. 92,817
Int. Cl.³ H01Q *15/02*
U.S. Cl. 343—909 **4 Claims**

1. A metallic radome, comprising:

a. a curved surface of thin metallic material;

b. a plurality of chevron-shaped slots in said curved surface;

c. said chevron-shaped slots being formed of two linear slot elements connected end-to-end at an angle of substantially 90°;



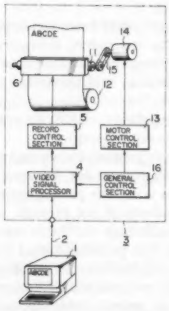
d. said chevron-shaped slots being uniformly distributed on said curved surface in a closely spaced pattern with adjacent linear slot elements parallel to each other.

4,287,521

CRT HARD COPY APPARATUS WITH MULTI-DIRECTIONAL SAMPLING AND PRINTING

Akiyoshi Hakoyama, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 21, 1980, Ser. No. 132,649
Claims priority, application Japan, Mar. 24, 1979, 54-33807
Int. Cl.³ G01D *9/00, 15/10;* **H05B** *3/00*
U.S. Cl. 346—35 **8 Claims**



1. A CRT hard copy apparatus for sampling a picture signal from a CRT display and recording the sampled signal on a recording paper, comprising:

a first sampling means for sampling said picture signal in the horizontal scanning line direction to produce a first sampled signal;

a second sampling means for sampling said picture signal in the vertical direction perpendicular to the horizontal scanning lines to produce a second sampled signal;

a switching means for selecting either of said first and second sampled signals;

a record control means for producing a record signal based on a selected sampled signal; and

a record head for recording said sampled picture signal on said recording paper on the basis of said record signal.

4,287,522
APPARATUS AND A METHOD FOR RECORDING INFORMATION

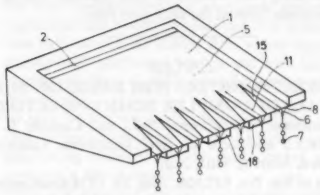
Rudolf Meyer, Leverkusen, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 31, 1980, Ser. No. 135,703

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1979, 2913219

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—75 **16 Claims**



1. A method of producing multiple liquid threads and liquid droplets for recording information on a data carrier, characterised in that

(a) The recording liquid for producing the liquid threads flows out of at least one feed slit in the upper portion of an inclined cascade outlet face,

(b) the liquid flows as a film over the outlet face and, in so doing, homogenises into a film,

(c) the homogeneous liquid film is broken up into liquid threads in the lower region of the entire width of the cascade outlet face,

(d) the liquid threads are broken up into droplets,

(e) the droplets fall vertically downwards in free fall parallel to each other,

(f) the droplets which are unwanted for information are separated and fed to a collector,

(g) and the droplets which are required for information impinge upon a data carrier, the data carrier being moved beneath the curtain of falling droplets.

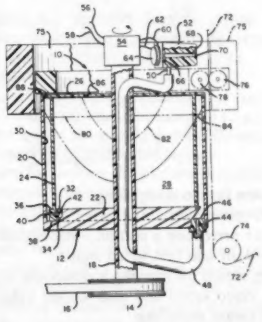
4,287,523
VALVE FOR INK JET PRINTER

Jacob E. Thomas, and Victor J. Italiano, both of Ithaca, N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 19, 1980, Ser. No. 122,106

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 R **20 Claims**



1. A system for controlling the ink supply for a rotary printer having a print head for ejecting ink droplets onto record media, said system comprising a

rotatable ink reservoir having a first cavity and a second cavity, an

ink supply line connected with said second cavity and with said print head, and

valve means positioned to control the flow of ink between said first cavity and said second cavity wherein the ink is free to flow between said cavities when said reservoir is at rest and wherein, responsive to centrifugal force, the ink is prevented from flowing between said cavities upon rotation of said reservoir.

4,287,524
ELECTROSTATIC RECORDING METHOD WITH DELAYED CONTROL VOLTAGE

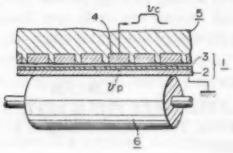
Masaru Ohnishi, and Kazuhiro Samejima, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1979, Ser. No. 47,821

Claims priority, application Japan, Jul. 25, 1978, 53-91065

Int. Cl.³ G03G *15/048*

U.S. Cl. 346—154 **2 Claims**



1. An electrostatic recording method for forming an electric charge image on a dielectric layer by (1) contacting a one surface control electrostatic recording head having rows of many recording needle electrodes and control electrodes adjacent to said recording needle electrodes, with the dielectric layer formed on a recording medium having a conductive substrate, and (2) applying a recording voltage to the recording needle electrodes and applying a control voltage having smaller rise time constant than the recording voltage to the control electrodes in the same period; the improvement wherein:

the control voltage is applied to the control electrodes at a time, T_d, later than the application of the recording voltage to the recording needle electrodes, T_d being of a size so that the total voltage induced in the conductive substrate by the control voltage and the recording voltage has reached a potential equal to a large fraction of the maximum potential, and T_d being significantly less than the time necessary for crosstalk voltage attenuation; whereby variations in environmental humidity and temperature do not effect recording density.

4,287,525
MULTI-PIN RECORD ELECTRODE ASSEMBLY AND DRIVING METHOD OF THE SAME

Takao Tagawa, Kashihara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 19, 1978, Ser. No. 943,870

Claims priority, application Japan, Sep. 21, 1977, 52-116203; Sep. 22, 1977, 52-129096[U]; Aug. 28, 1978, 53-105325

Int. Cl.³ G01O *15/06*; G03G *13/00*

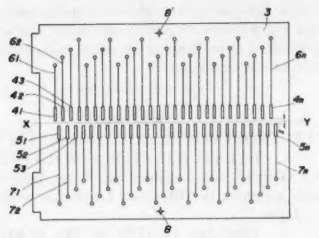
U.S. Cl. 346—155 **9 Claims**

1. A multi-pin record electrode assembly comprising:

an insulating substrate folded into two substrate portions along a fold line; and

first and second electrode sets formed on said substrate along said fold line, said first electrode set including a plurality of closely spaced electrodes arranged at a predetermined distance from each other along a first side of said fold line,

said second electrode set including a plurality of closely spaced electrodes arranged at said predetermined distance from each other along a second side of said fold line, said second electrode set being offset along said fold line from said first electrode set approximately one half said predetermined distance said electrodes of each set are spaced from each other;



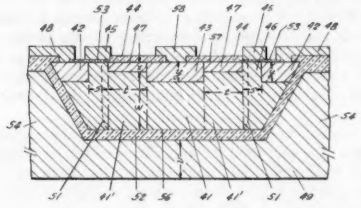
said substrate being folded so as to form a record electrode assembly having an edge formed along said fold line, said first and second electrode sets having alternating electrodes presented along said edge.

4,287,526

INSULATED GATE FIELD EFFECT TRANSISTOR

Hiraku Sakuma, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Japan

Continuation of Ser. No. 903,564, May 8, 1978, abandoned. This application Mar. 10, 1980, Ser. No. 128,376
Claims priority, application Japan, May 9, 1977, 52/52857
Int. Cl.³ H01L *29/72*
U.S. Cl. 357—23 **17 Claims**



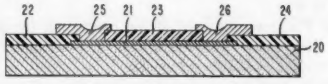
1. An insulated gate field effect transistor, comprising:
an insulator body having a generally planar major surface;
a semiconductor layer of a first conductivity type formed on said insulator body major surface, said semiconductor layer having a generally planar, major surface lying parallel to said insulator body major surface;
a source region of a second conductivity type, opposite of that of said first conductivity type, formed in said semiconductor layer along said major surface of said semiconductor layer;
a drain region of said second conductivity type formed in said semiconductor layer along said major surface of said semiconductor layer and spaced from said source region with a channel region lying therebetween;
an extension region of said second conductivity type formed in said semiconductor layer and extending from one of said source and drain regions to said channel region, said extension region having an impurity concentration lower than that of said one of said source and drain regions, one surface of said extension region being coincident with said major surface of said semiconductor layer, a second surface of said extension region being generally parallel to said insulator body surface and spaced therefrom such that a portion of said semiconductor layer lies between said second surface and said insulator body major surface, the total amount of effective impurity of said second conductivity type contained in said extension region being within a difference of 20 percent of the total amount of effective impurity of said first conductivity type contained in said semiconductor layer portion lying between said extension region and said insulator body;
a first insulating film formed on the entire first surface of said extension region;
a gate insulating film formed on said channel region; and
a gate electrode formed on said gate film.

4,287,527

OPTO-ELECTRONIC DEVICES BASED ON BULK CRYSTALS OF COMPLEX SEMICONDUCTORS

Klaus J. Bachmann, Piscataway, N.J., and Charles T. Ryan, Fishkill, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 937,950, Aug. 30, 1978 abandoned. This application Sep. 7, 1979, Ser. No. 73,206
Int. Cl.³ H01L *27/14*
U.S. Cl. 357—30 **4 Claims**



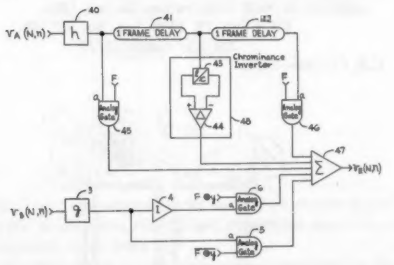
1. A device comprising a rectifying junction between a bulk crystal and an interfacing material characterized in that said bulk crystal has a composition of $Ga_xIn_{1-x}As_yP_{1-y}$ where $0<x\leqq 0.5$ and $0<y<1$, and has a defect density less than 10^6 cm^{-2} whereby current carriers are generated in said bulk crystal by infrared radiation.

4,287,528

TELEVISION SYSTEM

Paul M. Levy, 3 Butternut Ct., Dix Hills, N.Y. 11746

Continuation-in-part of Ser. No. 59,322, Jul. 20, 1979, which is a continuation-in-part of Ser. No. 20,874, Mar. 15, 1979, abandoned. This application Feb. 26, 1980, Ser. No. 124,927
Int. Cl.³ H04N *9/60*
U.S. Cl. 358—3 **21 Claims**



1. A television system comprising:
(a) means for providing a first video signal;
(b) means for providing a second video signal in time synchronism with said first video signal;
(c) encoding means for forming a composite video signal of said first video signal and said second video signal, said encoding means including:
(1) means for scaling the amplitude of said first video signal by a first factor;
(2) means for scaling the amplitude of said second video signal by a second factor;

(3) means for alternating the polarity of said scaled second video signal at the line rate;

(4) first means for delaying said scaled first video signal for one frame time;

(5) second means for delaying said delayed first video signal for one frame time;

(6) means for correcting the chrominance phase of said one frame delayed first video signal relative to the chrominance subcarrier reference signal;

(7) multiplexing means for generating a multiplexed first video signal, said multiplexing means including means for time multiplexing said amplitude scaled first video signal and said two frame delayed first video signal such that said amplitude scaled first video signal is passed during odd numbered frames and said two frame delayed first video signal is passed during even numbered frames; and

(8) means for summing said multiplexed first video signal, said chrominance phase corrected video signal and said alternating polarity second video signal to form said composite video signal;

(d) means for transmitting said composite video signal to means for receiving said composite video signal, said receiving means including:

(1) means for recovering said composite video signal from said received composite video signal; and

(2) means for decoding said second video signal from said received composite video signal, said decoding means including:

(a) means for scaling the amplitude of said received composite video signal by the scaling inverse of said second factor;

(b) first means for delaying said scaled composite video signal for one frame time;

(c) second means for delaying said delayed composite video signal for one frame time;

(d) means for correcting the chrominance phase of said one frame delayed composite video signal relative to the chrominance subcarrier reference signal; and

(e) means for forming, during even numbered frames, the absolute difference between said scaled composite video signal and said chrominance phase corrected video signal, and during odd numbered frames, the absolute difference between said chrominance phase corrected video signal and said two frame delayed composite video signal, to recover said second video signal.

4,287,529

TIME BASE ERROR CORRECTING APPARATUS

Mitsushige Tatami, Ebina, and Kazunobu Tsujikawa, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 23, 1979, Ser. No. 32,508
Claims priority, application Japan, Apr. 28, 1978, 53-51821
Int. Cl.³ H04N *5/76, 5/78, 5/34*
U.S. Cl. 358—8 **25 Claims**

1. Time-base error correcting apparatus for correcting time-base errors in a video signal, comprising:

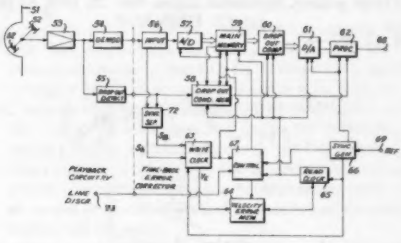
main memory means for storing picture elements in successive line intervals of said video signal;

write-in means for writing the picture elements of each line interval into said main memory means at a write-in clock rate synchronized with the timing information contained in said video signal;

read-out means for reading said stored picture elements of each line interval out of said main memory at a substantially constant reference read-out clock rate;

drop-out detecting means for detecting drop-out conditions in said video signal written into said main memory means, including drop-out conditions in the video information portion and in the synchronizing information portion of said video signal;

drop-out condition memory means for storing representations of detected drop-out conditions in synchronism with the writing in and reading out of said picture elements of each line interval into and from said main memory means, respectively, such that if a picture element is dropped out, a representation that said picture element has dropped out is stored in said drop-out condition memory means, and if synchronizing information is dropped out, a representation that said synchronizing information has dropped out is stored in said drop-out condition memory means; and



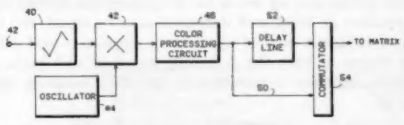
drop-out compensating means coupled to said main memory means for receiving each picture element of each line interval read out from said main memory means and normally operative to transmit each received picture element, said drop-out compensating means being responsive to a stored representation of a drop-out condition read out of said drop-out condition memory means to replace the picture element then received from said main memory means with a picture element disposed in the same relative position of the immediately preceding line interval.

4,287,530

DEMODULATOR SYSTEM INCLUDING A TUNABLE DISCRIMINATOR SUITABLE FOR USE IN A SECAM TELEVISION RECEIVER

Michael J. Gay, Chancy, and Johannes A. Gutmann, Geneva, both of Switzerland, assignors to Motorola Inc., Schaumburg, Ill.

Filed May 9, 1980, Ser. No. 148,347
Int. Cl.³ H04N *9/50*
U.S. Cl. 358—23 **4 Claims**



1. A demodulator circuit for demodulation of an applied television chrominance signal, the chrominance signal comprising first and second sequential subcarrier frequencies frequency modulated by respective R-Y and B-Y chroma information signals, including a single frequency discriminator, the improvement comprising:

the discriminator having an electrically tunable center frequency, said center frequency being repetitively tuned to a nominal center frequency during a part of a flyback period in response to a first control signal to produce a zero level output with a known reference frequency being applied thereto, the discriminator being offset by second and third control signals to first and second alternating center frequencies such that a zero output level is provided at the output of the discriminator at each of the two subcarrier frequencies, the zero output levels obtained in response to said subcarrier reference signals being caused

to be the same as said zero output level obtained in response to said known reference frequency.

4,287,531

DEFLECTION CONTROL APPARATUS FOR A BEAM INDEX COLOR CATHODE RAY TUBE

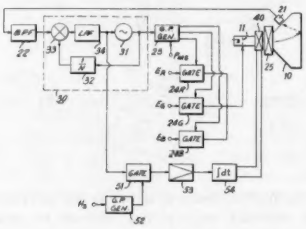
Ichiro Mitamura; Akira Tooyama, both of Tokyo, and Takashi Hosono, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 19, 1979, Ser. No. 95,557

Claims priority, application Japan, Nov. 21, 1978, 53-143760

Int. Cl.³ H04N *9/24*

U.S. Cl. 358—67 **15 Claims**



1. Deflection control apparatus for a beam index color television receiver of the type including a cathode ray tube adapted to display a video picture in response to a received color television signal, said cathode ray tube having index stripes disposed to be scanned by the electron beam of said cathode ray tube; detecting means for detecting when respective index stripes are scanned by said beam to produce an index signal, the frequency of said index signal varying from a predetermined frequency value when the scanning speed of said beam varies; oscillating means for generating an oscillating signal whose frequency is synchronized with said index signal; phase-locked loop means including comparing means for comparing said index signal to said oscillating signal to produce a control signal as a function of the difference therebetween and to adjust the frequency of said oscillating signal in accordance with said control signal; and switching means for switching color information signals to modulate said beam in response to said oscillating signal; said deflection control apparatus comprising deflection means for controlling the deflection of said beam; and integrating means for integrating said control signal to produce an integrated deflection control signal, the integrated deflection control signal being supplied to said deflection means to vary the deflecting speed of said beam and thereby maintain a substantially constant scanning speed thereof.

4,287,532

IMAGE-SHEARING APPARATUS

Derek S. Moore, York, England, assignor to Vickers Limited, London, England

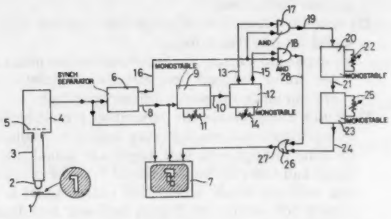
Filed Oct. 15, 1979, Ser. No. 85,067

Claims priority, application United Kingdom, Oct. 27, 1978, 42156/78

Int. Cl.³ H04M *7/18*

U.S. Cl. 358—107 **16 Claims**

1. Image-shearing apparatus comprising a television camera tube for receiving an optical image from a microscope objective and producing an output signal representative of the image; electrical circuitry coupled to said camera and responsive to the output signal for providing one or more display signals; and at least one television display unit which has a monitor and is coupled to said electrical circuitry and responsive to the one or more display signals to produce on said television monitor an image corresponding to the optical image in which at least one horizontal band of each frame is uniformly shifted laterally



by a selectively variable amount relative to the remainder of the frame.

4,287,533

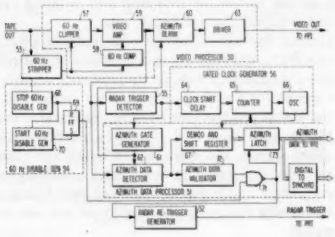
APPARATUS FOR RECORDING AND PLAYING BACK RADAR VIDEO WITH CONVENTIONAL VIDEO RECORDER

Carl E. Schwab, Huntington Station; Peter Foley, Manhasset, and Charles A. Caputo, Stony Brook, all of N.Y., assignors to General Signal Corporation, Stamford, Conn.

Continuation of Ser. No. 783,887, Apr. 1, 1977, abandoned. This application Jul. 23, 1979, Ser. No. 59,703

Int. Cl.³ H04N *5/76*

U.S. Cl. 358—127 **9 Claims**



1. Apparatus to adapt signals from a radar system for recording on a TV video recorder and to adapt played back signals from said TV video recorder to drive a PPI display, said apparatus including a multiplexer providing to said TV video recorder a signal stream including a radar timing signal, a pulse stream containing azimuth information, a radar video signal, and a head synchronizing pulse stream of pulse rate independent of said radar timing signal and a demultiplexer for adapting said played back signal, comprising a replica of said signal stream, for driving said PPI display, said demultiplexer comprising:

video processor means responsive to said played back signal for outputting only said radar video signal to said PPI display,

disable generator means responsive to said head synchronizing pulse stream for providing a control pulse stream of rate equal to said head synchronizing pulse rate but of width larger than said head synchronizing pulse,

means for demodulating said pulse stream containing azimuth information,

coupling means responsive to said means for demodulating for coupling azimuth information to said PPI display,

and inhibiting means for inhibiting operation of said coupling means during the duration of any of said control pulses.

4,287,534

METHOD AND SYSTEM FOR CREATING A GEOMETRIC FIGURE AT A SELECTED POSITION ON THE SCREEN OF A CATHODE RAY TUBE

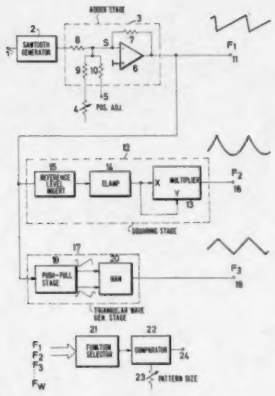
Winfried Pohl, Büttelborn, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 4, 1979, Ser. No. 100,257

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1978, 2853675

Int. Cl.³ H04N *5/22*

U.S. Cl. 358—183 **17 Claims**



1. In a method for generating control signals for wipe transitions of video signals in the form of a geometric figure at a selectable position on the screen of a cathode ray tube, wherein the shape of said geometric figure is controlled by combination of a plurality of input signal sequences each having a predetermined variation with respect to time, a process for changing said position on said screen of said geometric figure in dependence on the setting of an externally controllable adjustment element, comprising the steps of

adding a DC signal having an adjustable amplitude to at least one of said input signal sequences; and

varying said amplitude of said DC signals in dependence upon said setting of said adjustment element, whereby said position on said screen of said geometric figure depends upon said setting of said externally controllable adjustment element.

4,287,535

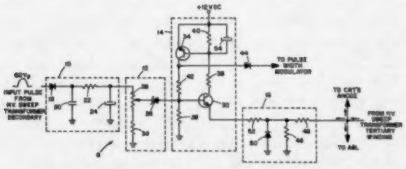
HIGH VOLTAGE SHUTDOWN CIRCUIT WITH CURRENT FEEDBACK FOR CATHODE RAY TUBE

Bharat N. Vakil, Coral Springs, Fla., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Oct. 24, 1979, Ser. No. 87,901

Int. Cl.³ H04N *5/68*

U.S. Cl. 358—243 **9 Claims**



1. In a television receiver having a cathode ray tube display device in which is produced an electron beam current and including an output transformer, said output transformer including a primary winding energized by a high voltage generation network responsive to periodically recurring input voltage pulses from a pulse width modulator, a tertiary winding energized by said primary winding coupled to an ultor of said cathode ray tube for applying a first high voltage to said ultor for initiating electron beam current in said cathode ray tube and coupled to a control grid of said cathode ray tube for applying a second lower voltage to said control grid for regulating electron beam current intensity, and an output pulse secondary winding energized by said primary winding for generating output pulses proportional in magnitude to the high voltage applied to said ultor, a high voltage shutdown circuit comprising:

DC voltage level conversion means for receiving pulses from said output pulse secondary winding and for converting said output pulses to a DC voltage level, said DC voltage level being proportional to the ultor voltage;

DC voltage level threshold detecting means coupled to said DC voltage level conversion means for producing an output proportional in magnitude to said DC voltage level when said DC voltage level corresponding to a predetermined ultor voltage exceeds a predetermined value, with no output produced when said predetermined DC voltage level is not exceeded;

transistor conducting means for coupling said DC voltage level threshold detecting means to said pulse width modulator such that the output of said pulse width modulator to said high voltage generation network is a DC level signal when said predetermined ultor voltage is exceeded, said DC level signal rendering the high voltage generation network inoperative thereby turning off said output transformer and said cathode ray tube; and

voltage biasing means coupling the second lower voltage output of said tertiary winding to said transistor conducting means for varying said predetermined ultor voltage required for turning on said high voltage shutdown circuit as a function of output transformer tertiary winding current, thus permitting safe cathode ray tube operation at optimum voltage level and electron beam current intensity combinations.

4,287,536

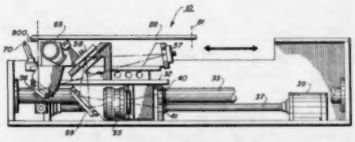
GAIN CONTROL FOR SCANNING ARRAYS

Douglas G. Wiggins, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 12, 1979, Ser. No. 84,201

Int. Cl.³ H04N *1/40, 3/14*

U.S. Cl. 358—282 **8 Claims**



1. In a raster scanner having at least two arrays, each of said arrays having plural image viewing elements for viewing an original to provide video signals representative of the image on the original being viewed, the combination of:

(a) a calibration strip having an image of preset optical density for scanning by said arrays;

(b) comparator means for comparing the signal output of at least one viewing element in each of said arrays from scanning said calibration strip with a preset reference signal to provide at least one corrective signal for each of said arrays;

(c) means for modifying the signal output level of each of said arrays in accordance with the corrective signal for that array,

(d) the viewing fields of adjoining arrays overlapping to assure an uninterrupted scan line; and

(e) crossover means effective on readout of the image signals from said arrays to crossover from a viewing element of one array to the next succeeding viewing element of the next array within said overlap;

said one viewing element from each of said arrays consisting of only said array viewing elements in the areas where said arrays overlap whereby to minimize differences between said arrays at the point of crossover.

4,287,537

METHOD OF REPRODUCING GRAPHIC MATERIAL ON AN INTAGLIO FORM

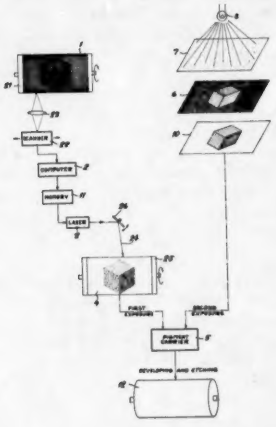
Paul Pfau, Essen; Thomas E. Fausel, and Arthur Grunder, both of Ostfildern, all of Fed. Rep. of Germany, assignors to Simom S.A., Zug, Switzerland

Filed Feb. 9, 1979, Ser. No. 10,994

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1978, 2805874

Int. Cl.³ H04N *1/22*

U.S. Cl. 358—299 **5 Claims**



1. A method of reproducing copy on a printing surface, comprising the steps of:

preparing a basic planographic halftone image from the copy to be reproduced, said basic image being divided into a multiplicity of disjointed elemental areas of different tonal values;

photoelectrically scanning said basic image to generate a train of analog pulses varying in amplitude with the tonal values of said elemental areas;

transforming said analog pulses into binary pulse codes;

sweeping a laser beam, modulated by said binary pulse codes, across a photosensitive film to form an intermediate dot pattern thereon;

projecting the dot pattern from said film onto a photosensitive pigment carrier to produce thereon a latent image forming a masking layer upon development of said carrier; and

etching said printing surface through said masking layer, thereby producing an array of dots conforming to said pattern.

4,287,538

MAGNETIC HEAD TRACKING CONTROL SYSTEM

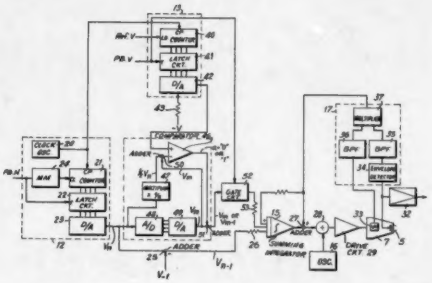
Hitoshi Sakamoto, Zama, and Yoshiaki Wakisaka, Atsugi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 14,764, Feb. 23, 1979. This application Sep. 6, 1979, Ser. No. 73,246

Claims priority, application Japan, Sep. 7, 1978, 53-110174

Int. Cl.³ H04N *5/78*

U.S. Cl. 360—10 **23 Claims**



18. An apparatus for reproducing information signals recorded in successive parallel tracks on a record medium while the latter is advanced at a predetermined recording speed in a direction of an angle to the direction along said tracks, said apparatus comprising:

transducer means movable along each of the tracks in a scanning path from a beginning end to a concluding end thereof for reproducing the recorded information signals;

transducer deflecting means for deflecting said transducer means in a direction which is transverse to said direction along the tracks;

means for supplying a drive signal to said transducer deflecting means so as to cause said transducer means to follow a desired one of the tracks in moving from the beginning end to the concluding end of said path;

means for producing a first signal which corresponds to the deflection of said transducer deflecting means needed to cause the transducer means to follow said desired one of the tracks at a predetermined position therealong;

means for producing a continuously variable second signal which corresponds to the value

$$-\frac{1}{2}n+\frac{(1-n)(100-d)}{100}+m$$

in which n is the ratio of the speed of advancement of the record medium during reproducing to said recording speed, d is the percentage of the distance along each track from said beginning end to said predetermined position therealong, and m is an integer that is no greater than n and no less than n−1;

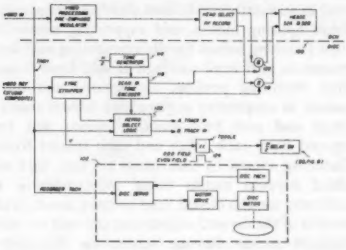
means for producing a control signal on the basis of the relation of said first and second signals; and

means for applying said control signal to said transducer deflecting means so as to determine the position of said transducer means at said beginning end of the scanning path and, thereby, the next desired track to be followed by the transducer means.

4,287,539
SEGMENTED VIDEO RECORDING WITH SEGMENT IDENTIFICATION CODES

James A. Bixby, San Diego; James U. Lemke, Del Mar, and Robert A. Lentz, Santa Fe, all of Calif., assignors to Spin Physics, Inc., San Diego, Calif.

Division of Ser. No. 780,945, Mar. 24, 1977, Pat. No. 4,193,098.
This application Jun. 18, 1979, Ser. No. 49,383
Int. Cl.³ H04N *5/785*
U.S. Cl. 360—18 **2 Claims**



1. Apparatus for use with a recorder of the type adapted to record segmented video field information on a recording medium, comprising

(a) means for producing discrete signals corresponding to the segments of a plurality of video fields each of which fields is comprised of the same number of segments;

(b) means for producing code signals corresponding to and identifying each segment of each field, said code signals

1. for any given field being all different, and

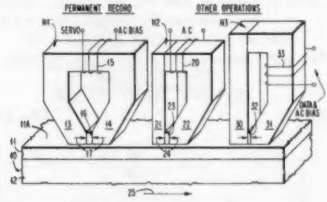
2. for all fields being such that corresponding segments of all such fields have the same identifying code, and

(c) means for combining said code signals with their respective segment signals, thereby to form a composite signal for recording on said recording medium.

4,287,540
STABILIZED RECORDING

Samuel D. Cheatham, Arvada, Colo., and Munro K. Haynes, Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 7, 1979, Ser. No. 101,349
Int. Cl.³ G11B *5/02, 5/25*
U.S. Cl. 360—18 **3 Claims**



1. The method of magnetically recording signals in a magnetic record member and for stabilizing such recorded signals, said record member having a unitary magnetic layer, the steps of:

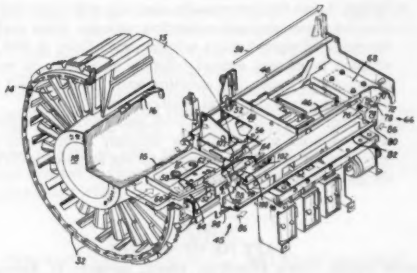
recording a first signal in said magnetic layer using a first transducer by relatively moving said layer and transducer such that said gap scans a given track to record said first signal therein, said first transducer having a given extended gap length and having pole pieces exhibiting high magnetic saturation equal to or greater than the permeability of mu metal, and

AC erasing said magnetic layer along said given track using a second transducer having a given gap length less than said extended gap length thereby partially surface erasing said first signal recorded in said given track to thereby stabilize same for later plural successive magnetic recording operations along said given track and using gap lengths in third transducers less than said extended gap length and selecting said second and third transducers to have lower pole tip magnetic saturation than said first transducer whereby the later magnetic recording operations along said given track do not partially further erase said recorded first signal.

4,287,541
CASSETTE LOADING DEVICE FOR A CASSETTE RECORDING APPARATUS

Makoto Tanahashi, Yokohama; Hisashi Yamauchi, Tokyo, and Takeshi Yamamoto, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 30, 1979, Ser. No. 43,734
Claims priority, application Japan, May 29, 1978, 53-71699[U]
Int. Cl.³ G11B *15/68, 23/04*
U.S. Cl. 360—92 **12 Claims**



1. A cassette loading device for a cassette recording apparatus, said cassette loading device having cassette magazine with a plurality of cassette receiving sections each adapted to contain a tape cassette and a plurality of slip receiving sections each aligned with a respective one of said cassette receiving sections and communicating with the latter for receiving an information slip with information thereon concerning the recording of a tape cassette in said respective cassette receiving section, drive means for intermittently moving said cassette magazine so as to successively dispose said cassette receiving sections at a cassette loading position, and a cassette loading mechanism adapted to enter the one cassette receiving section at said loading position through the respective slip receiving section for loading a tape cassette from said one cassette receiving section into the cassette recording apparatus; said device further comprising:

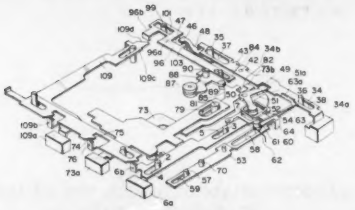
means for detecting the presence of an information slip in a slip receiving section which is in immediately trailing relation, considered in the direction of intermittent movement of said cassette magazine, in respect to the slip receiving section corresponding to the cassette receiving section then at said cassette loading position and for generating an output signal in response thereto; and

means responsive to said output signal for preventing further movement of said cassette magazine by said drive means upon detection of an information slip in said slip receiving section which is in said immediately trailing relation.

4,287,542
RECORDING AND REPRODUCING DEVICE

Hiroshi Okuda, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 6, 1979, Ser. No. 73,103
Claims priority, application Japan, Sep. 8, 1978, 53-109785
Int. Cl.[3] G11B *5/54, 15/10*
U.S. Cl. 360—105 4 Claims



1. An operating mode changing assembly for a recording and reproducing apparatus comprising:

a reproduction actuator lever movable from a first inactive position to a second operative position,

a lock lever for holding said reproduction actuator lever in its said second operative position,

a recording actuator lever movable from a first inactive position to a second operative position,

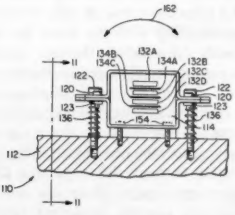
coupling means for operatively coupling said reproduction actuator lever and said recording actuator lever and for moving said reproduction actuator lever from its said first position to its said second position responsive to movement of said recording actuator lever from its said first position to its said second position, and

means operatively associated with said recording actuator lever to hold said recording actuator lever in its said second position when said reproducing actuator lever is in its said second position.

4,287,543
TAPE HEAD MOUNT

David Banks, South Hamilton, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Dec. 31, 1979, Ser. No. 108,423
Int. Cl.[3] G11B *5/56, 21/24*
U.S. Cl. 360—109 10 Claims



1. In a magnetic tape head assembly including a head carriage, a tape head having a forward face containing pole piece means, means for adjustably mounting the tape head on the head carriage and means on said head carriage for guiding the tape adjacent the pole piece means at the forward face of the tape head at a particular orientation relative to the head carriage, the improvement wherein said adjustable head mounting means comprises:

head housing means for retaining said tape head, said head housing means comprising an engaging portion for rigidly embracing said tape head, a first mounting portion and a beam portion extending between said first mounting portion and said head-engaging portion, a pair of mounting holes therethrough on transversely opposite sides of a longitudinal midline of said beam portion, and second and third mounting portions each spaced from said first mounting portion by said beam portion and respectively positioned on transversely opposite sides of the longitudinal midline of said beam portion;

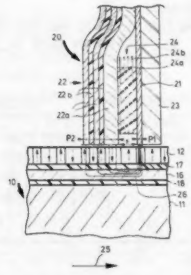
biasing means for urging said head housing means relatively upward away from said head carriage; and

means for supporting said head housing means relative to said head carriage at at least three spaced positions on said head housing means, said supporting means comprising first fastening means fixedly connecting said head housing means to said head carriage at said head housing means first mounting portion, and second and third support means in supportive engagement between said head carriage and said head housing means and respectively spaced from each other and each spaced from said first fastening means by said beam portion, said second and third support means being independently adjustable, whereby motion of said head housing means is constrained to that of the desired adjustment and said second and third support means having respective threaded fastening means each passing clearly through a respective one of said pair of mounting holes and into connecting engagement with said head carriage, each said threaded fastening means including a shoulder portion engaging and acting to displace said head-engaging portion in response to rotation of at least a portion of said fastening means relative to said head carriage and said head-holding means.

4,287,544
MAGNETIC DATA CARRIER FOR PERPENDICULAR RECORDING

Jean-Pierre Lazzari, Montfort-l'Amaury, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France

Filed Jan. 2, 1979, Ser. No. 10
Claims priority, application France, Jun. 13, 1978, 78 17641
Int. Cl.[3] G11B *5/68*
U.S. Cl. 360—131 19 Claims



1. A carrier adapted to have data recorded therein by perpendicular magnetic recording comprising a non-magnetic substrate having at least one plane surface and a plurality of magnetic layers on said substrate, said plurality of layers including a first magnetic data layer of anisotropic magnetic material for recording of data having its axis of easy magnetization perpendicular to the said surface and comprising, in the lengthwise direction, successive magnetic cells separated by transitions and an additional magnetic layer of anisotropic magnetic material having its axis of hard magnetization is parallel to the surface, said additional layer being disposed between the substrate and the said first layer, the plane of anisotropy of the first magnetic data layer being perpendicular

to the said surface of the substrate, and the plane of anisotropy of the additional layer being parallel to the said surface such that the axis of hard magnetization of the additional layer is substantially parallel to the lengthwise direction of the data layer.

4,287,545

DIFFERENTIAL TRANSFORMER

Ferdy Mayer, 18 rue Thiers, 38000 Grenoble, France

Filed Jun. 6, 1979, Ser. No. 45,867

Claims priority, application France, Jun. 8, 1978, 78 17113

Int. Cl.³ H02H *3/26*; H01F *40/06*

U.S. Cl. 361—44 **6 Claims**

1. A differential current transformer for an electrical installation protecting device, comprising:

a magnetic torus with at least two primary coils having the same number of turns, said magnetic torus including high permeability material, said primary coils being traversed by opposed mains currents, said magnetic torus further including a secondary coil;

wherein each of said primary coils includes one turn;

wherein each of said two primary coils has a thinner section in a portion of each of said coils located in a central aperture of said torus and each of said primary coils includes a larger section in portions adjacent to said thinner section; and

wherein said larger sections of each of said primary coils form thermal masses in view of increasing the dissipation of heat generated in the thinner portion.

4,287,546

Patent Not Issued For This Number

4,287,547

METHOD AND APPARATUS FOR FAULT AND/OR FAULT DIRECTION DETECTION

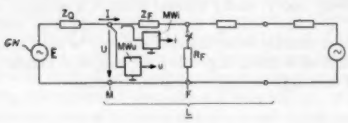
Michael Vitins, Zurich, Switzerland, assignor to BBC Brown, Boveri & Co. Ltd., Baden, Switzerland

Filed Aug. 15, 1979, Ser. No. 66,783

Claims priority, application Switzerland, Aug. 29, 1979, 9105/78

Int. Cl.³ H02H *3/40, 7/26*

U.S. Cl. 361—82 **19 Claims**



1. A method for selectively detecting at least faults or fault direction, or both, at electrical lines, comprising the steps of:

generating current surge signals and voltage surge signals, in accordance with the change as a function of time of line current and line voltage, respectively, in relation to the steady state course of the current and voltage, respectively;

comparing the formed current surge signals and voltage surge signals with a threshold value;

said comparison step including comparing at least one of the surge signals with at least one threshold value which is dependent upon the other surge signal; and

upon exceeding or falling below the threshold value deriving a trip signal or blocking signal for a protective device.

4,287,548

SURGE VOLTAGE ARRESTER WITH REDUCED MINIMUM OPERATING SURGE VOLTAGE

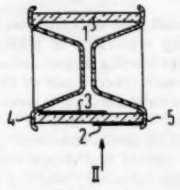
Axel Hahndorff, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 18, 1979, Ser. No. 58,459

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1978, 2834088

Int. Cl.³ H02H *9/06*

U.S. Cl. 361—120 **12 Claims**



1. A surge voltage arrester, comprising a gas-filled housing incorporating two main electrodes disposed opposite one another, said electrodes being supported in a gastight fashion by the ends of a tubular insulating member, at least one coating of electrically conductive material extending over a portion of the interior length of said insulating member, at least one electrically conductive surface on the exterior of said insulating member which at least partially overlaps said coating, and means adapted to establish an electric field between said coating and said surface.

4,287,549

CIRCUIT FOR CHARGING A RELEASE MAGNET ENERGIZING CAPACITOR IN A CAMERA

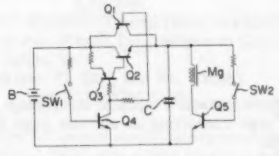
Hiroshi Hasegawa, and Osamu Maida, both of Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 12, 1979, Ser. No. 102,829

Claims priority, application Japan, Dec. 20, 1978, 53-173921[U]

Int. Cl.³ G03B *7/08, 9/08*

U.S. Cl. 361—156 **2 Claims**



1. A capacitor charging circuit in a camera having switch means series-connected between a DC power source and a release magnet energizing capacitor and in which charging of said capacitor is effected by closing said switch means, the improvement residing in that said switch means comprises a parallel connection of an emitter-grounded transistor for a first switch with said capacitor as the load and a collector-grounded transistor for a second switch with said capacitor as the load.

4,287,550

DRIVING CIRCUIT FOR PRINTING DEVICE IN ELECTRONIC CASH REGISTER

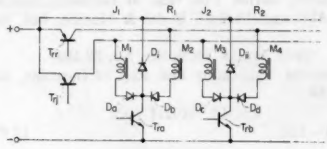
Yasuhiro Wada, Niiza, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Mar. 26, 1980, Ser. No. 134,334

Claims priority, application Japan, Mar. 30, 1979, 54-41323[U]

Int. Cl.³ H01H *47/00*

U.S. Cl. 361—167 **3 Claims**



1. A driving circuit for printing devices in an electronic cash register comprising a plurality of pairs of journal printing magnets and receipt printing magnets arranged adjacently and independently of each other, a pair of first diodes which are connected in the normal direction in series respectively to said respective magnets in a pair and are connected with each other, a first switching means connected between the connecting point of said pair of first diodes and one terminal of a current source, a second diode connected in the reverse direction between said connecting point and the other terminal of said current source, a first feeding line connected in common to said plurality of journal printing magnets, a second switching means connected between said first feeding line and said current source, a second feeding line connected in common to said plurality of receipt printing magnets, and a third switching means connected between said second feeding line and said current source.

4,287,551

ELEVATOR TRACTION MACHINE

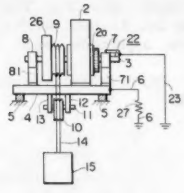
Eiki Watanabe, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 24, 1979, Ser. No. 60,108

Claims priority, application Japan, Jul. 26, 1978, 53-91240

Int. Cl.³ H02H *1/00*

U.S. Cl. 361—212 **13 Claims**



1. An elevator traction machine comprising:

a main rope connecting an elevator cage and a counterweight,

traction sheave having said main rope entrained thereover,

a motor controlled by a semiconductor switching circuit for driving said traction sheave to vertically move said elevator cage and said counter weight in opposite directions,

A brake wheel coupled to a shaft of said motor, said brake wheel being frictionally forced to brake said motor during the stop of the cage,

bearings for supporting said motor shaft,

a current collector in contact with said motor shaft for collecting shaft current,

a first grounding circuit for grounding said shaft through said current collector, and

a second grounding circuit for grounding said shaft through at least one of said bearings,

wherein the impedance of said second grounding circuit is greater than that of said first grounding circuit.

4,287,552

ELECTROSTATIC SPRAY PISTOL

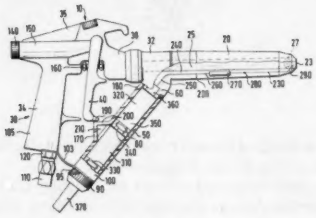
Josef Wagner, Friedrichshafen, Fed. Rep. of Germany, and Willi Huber, Altstätten, Switzerland, assignors to J. Wagner AG, Fed. Rep. of Germany

Filed Apr. 23, 1979, Ser. No. 32,417

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1978, 2818938

Int. Cl.³ B05B *5/02*

U.S. Cl. 361—228 **6 Claims**



1. An improved electrostatic manual spray gun having a barrel and a housing with a handle, the barrel being affixed at a proximal end to one end of the housing at an angle with respect to the handle; a distribution system for the material to be sprayed within the housing being operably connected to a boring through the barrel and having a manually operable trigger rotatably affixed to the housing; the trigger being operable to control the flow of material to be applied through the housing and barrel and having further circuitry including a high voltage multiplier circuit mounted on the gun operably connected to a spray electrode located adjacent a distal end of the boring in the barrel; the improvement comprising:

removable connection means interposed between the one end of the housing and the proximal end of the barrel to removably attach the barrel to the housing;

a hollow trigger guard spaced apart from the distribution system and from the boring through the barrel, said trigger guard has a first end fixedly connected to the proximal end of the barrel of the spray gun, and a second end removably affixed to a lower end of the handle of the spray gun; said high voltage multiplier circuit being modular and removably mounted within said trigger guard;

a relatively low voltage input cable affixed to said second end of said trigger guard and connected by electrical means for conduction to said high voltage multiplier module;

switch means cooperating with said electrical means, to selectively apply, under manual control, a selected input signal to a low voltage input end of said high voltage multiplier module, whereby said gun may be used to apply hot material without degrading the electrical characteristics of said high voltage multiplier module.

4,287,553

CAPACITIVE PRESSURE TRANSDUCER

Peter F. Braunlich, Pullman, Wash., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jun. 6, 1980, Ser. No. 156,970

Int. Cl.³ H01G *7/00*

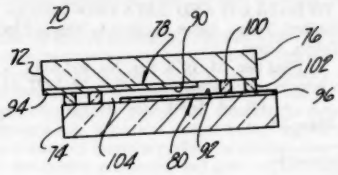
U.S. Cl. 361—283 **10 Claims**

1. A capacitive pressure transducer comprising:

a first diaphragm having a pressure responsive region thereon and deflectable in response to the local pressure;

first means spaced from said first diaphragm defining a gap therebetween;

pressure responsive means applied to the said pressure responsive region of said first diaphragm for transducing said pressure to be measured into measurable signals;



dual sealing means for separating said first diaphragm and said first means, and for forming a plurality of sealed cavities therebetween surrounding said pressure responsive region.

4,287,554

RADIATION APPARATUS

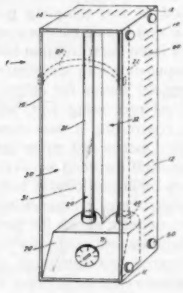
Friedrich Wolff, Lindenring 17, D-6000 Frankfurt 60, Fed. Rep. of Germany

Filed Jun. 29, 1979, Ser. No. 53,515

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1978, 2829117; Oct. 24, 1978, 2846221

Int. Cl.³ F21S *2/00*

U.S. Cl. 362—218 **35 Claims**



1. Apparatus for producing ultraviolet radiation, particularly a quick-tanning sunlamp, comprising a source of substantially uniform ultraviolet radiation, including at least two spaced-apart tubular low-pressure mercury lamps; means for intercepting at least the major percentage of wavelength bands of ultraviolet radiation below approximately 300 nm; and support means cooperating with said source and defining at least one opening for the escape of ultraviolet radiation consisting essentially of the remaining wavelength band of ultraviolet radiation, said support means including reflector means which includes for each of said lamps a trough-shaped reflector surrounding the respective lamp along at least one arc, at least one intermediate portion between adjacent ones of said lamps, and two lateral portions having zones projecting forwardly beyond said intermediate portion and spaced therefrom across the respective reflectors, said lateral portions having forward edge portions defining said opening and the space between said lateral portions and forwardly of said intermediate portion being substantially unobstructed, said source, in cooperation with said reflector means, thus establishing a high-density radiation field in the vicinity of said opening, the heat output of said lamps being sufficiently low so that the temperature in the region of said radiation field is below the range of discomfort of a person exposed to said radiation field.

4,287,555

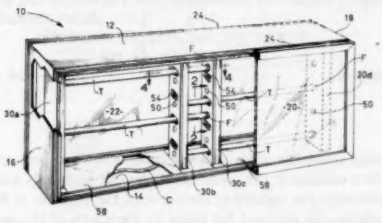
STRUT RACEWAYS FOR SIGN BOXES

Johann Stilling, Apt. #A1001, 1141 Royal York Rd., Islington, Ontario, Canada

Filed Mar. 10, 1978, Ser. No. 885,328

Int. Cl.³ F21S *3/00*

U.S. Cl. 362—225 **16 Claims**



1. An electrical raceway for incorporation in a double-sided sign box to provide structural reinforcement to such a sign box when incorporated therein so as to extend between spaced apart walls thereof, for the mounting of electrical receptacles for elongated lighting tubes and for housing electrical conductors connected to such receptacles for the supply of electricity thereto and which raceway comprises;

an elongated and hollow structure adapted to be disposed within such a sign box between such spaced apart walls thereof with such electrical conductors disposed therewithin and having mutually spaced apart side walls;

electrical receptacle opening zones formed in said side walls adapted to have electrical lighting fixture receptacles secured therein for the terminal engagement of elongated electrical lighting tubes;

lighting tube openings in said side walls, spaced longitudinally apart from said opening zones along said side walls, said openings being formed in aligned pairs for the free disposition therethrough of other such elongated electrical lighting tubes whereby such a tube may pass completely through such raceway without contacting the same, and,

at least one retaining member adapted to project between said side walls of said raceway adjacent such pairs of openings to retain electrical conductors in position within said raceway transversely outwardly of such lighting tubes extending through said aligned openings.

4,287,556

CAPACITIVE CURRENT LIMITING INVERTER

Walter G. Borland, Fort Wayne, Ind., assignor to General Electric Company, Salem, Va.

Filed Dec. 17, 1979, Ser. No. 104,682

Int. Cl.³ H02M *1/08*

U.S. Cl. 363—41 **7 Claims**

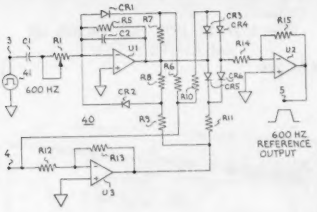
1. A high voltage AC power supply having means for limiting peak capacitive current into a load having a substantial capacitive component, comprising:

a DC electrical energy source;

a pulse-width modulated (PWM) inverter for converting DC electrical energy to AC electrical energy;

a transformer including a pair of output terminals for connection to the load, the transformer serving to transform the AC electrical energy from the inverter to high voltage AC electrical energy to be delivered to the load and to provide isolation between the DC electrical energy source and the AC electrical energy delivered to the output terminals;

means for providing to the PWM inverter a reference voltage waveform having substantially linear rise and fall times and having a substantially flat top during positive and negative peaks for synthesizing an inverter output voltage waveform having substantially the same shape as



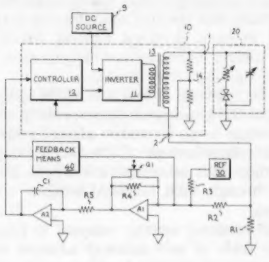
said reference voltage waveform; whereby, peak capacitive current at the transformer output terminals and thus through the switching elements of the inverter is limited during the rise and fall times by the shape of the inverter output voltage waveform to a value substantially less than a waveform with exponential rise and fall times.

4,287,557

INVERTER WITH IMPROVED REGULATION

Robert F. Brehse, Fort Wayne, Ind., assignor to General Electric Company, Salem, Va.

Filed Dec. 17, 1979, Ser. No. 104,572
Int. Cl.[3] H02P *13/20*; G05F *1/40*
U.S. Cl. 363—95 **9 Claims**



1. An electrical circuit for supplying high-voltage AC electrical energy to and for regulating resistive current through a complex load having variable resistive and variable shunt capacitive components, the circuit being of the type including: a voltage-controlled inverter having a pair of output terminals, the voltage controlled inverter producing an output voltage waveform at least a portion of each half cycle thereof having a dv/dt approximately equal to zero; means for sensing output current; a reference voltage source; means for comparing a voltage proportional to the sensed current with the reference voltage and for producing an amplified error voltage; means for sampling the amplified error voltage when dv/dt of output voltage is approximately equal to zero; means for obtaining a long-term average of a plurality of samples of the amplified error voltage; and means for applying the long-term average to the inverter to control the amplitude of the high-voltage AC waveform supplied to the complex load; wherein the improvement comprises:

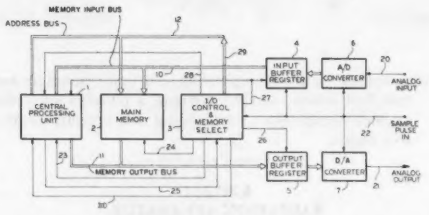
means for compensating for variations in load current resulting when a changing characteristic of the complex load causes variations in the ratio of peak to average rectified resistive current through the complex load so as to provide a substantially constant average rectified resistive output current.

4,287,558

SAMPLED DATA PROCESSING SYSTEM HAVING MEMORY WITH AREAS ALTERNATELY DEDICATED TO DATA I/O AND DATA PROCESSING

Takao Nishitani, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 21, 1978, Ser. No. 944,635
Claims priority, application Japan, Sep. 29, 1977, 52-117611
Int. Cl.[3] G06F *3/05, 13/00*
U.S. Cl. 364—200 **2 Claims**



1. A data processing system for processing input data received in a timed relationship with a sampling pulse and for processing output data in said timed relationship, said system having a memory means for storing data used for calculation and input/output, said memory means including a data input-/output memory area and a data processing memory area, a central processing unit with a cycle time which is shorter than the repetition period of said sampling pulse for producing address bits giving access to said memory means and executing an operation on said input data, an input buffer register means for inputting said input data into said central processing unit, an output buffer register means for outputting the data processed by said central processing unit, and an input/output control means for controlling a data-transferring operation between said memory means and either said input or output buffer register means and disposed between said central processing unit and said input and output buffer register means, said input/output control means comprising:

a. an input/output counter means for performing said data-transferring operation and cyclically producing, independently of said central processing unit, address bits to give access to said memory means in order to input and output data to and from said memory means;

b. a memory selection means for adding a specific one bit to the address bits fed from the central processing unit so that said data processing area of the memory means is accessed to transfer data between said central processing unit and the memory means and for adding said specific one bit after logical inversion in response to said sampling pulse and to a signal representative of the absence of an access by said central processing unit to said memory means to the address bits fed from said input/output counter means so that said data input/output area is accessed to transfer from said input/output counter means into said output buffer register means to data stored in the address of said memory means designated by said address bits to which said specific one bit after logical inversion is added, and to transfer the data stored in said input buffer register means into the memory means at the address designated by the address bits to which said specific one bit after logical inversion is added;

c. means responsive to a completion of a cycle of said input-/output counter means by one block of data and to the completion of the input and output to and from said memory means of one block of data for inverting the output signal of said memory selection means, to inform said central processing unit of the completion of the input and

output operations responsive to one block of data, and for resetting said input/output counter means;

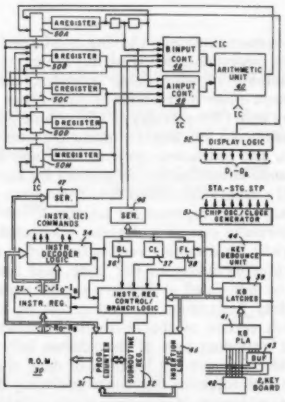
d. means responsive to the completion of the data transfer between said memory means and said input and output buffer register means for advancing said input/output counter means by a given number and for inhibiting the input/output operations until the next sampling pulse is given; and

e. wherein the area of said memory means where data stored are subjected to processing by said central processing unit is different from another area of said memory means where data transfer is carried out between said input and output buffer register means, and wherein the data transfer between said input and output buffer register means and said memory means is performed during a time period when said central processing unit does not have access to said memory means, whereby data are transferred one by one every time said sampling pulse is given.

4,287,559
ELECTRONIC MICROPROCESSOR SYSTEM HAVING TWO CYCLE BRANCH LOGIC

Steven J. Easley, Houston, and George L. Brantingham, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 766,998, Feb. 9, 1977, abandoned. This application Dec. 15, 1978, Ser. No. 970,080
Int. Cl.³ G06F 9/26
U.S. Cl. 364—200 **8 Claims**



1. An electronic data processing system comprising:

(a) an instruction memory for storing a plurality of instruction words in sequential memory locations, said plurality of instruction words having at least one set of a branch instruction word followed by a branch address instruction word in the next sequential memory location, said branch address instruction word being solely indicative of one of said memory locations, said instruction memory further for outputting a particular instruction word upon reception of a memory address indicative of said memory location of said particular instruction word;

(b) a program counter for storing therein a memory address solely indicative of a particular memory location of said instruction memory including means for applying said memory address to said instruction memory;

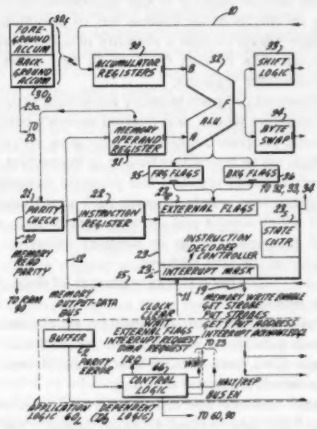
(c) an instruction decoder logic means, responsive to instruction words outputted from said instruction memory, for decoding said instruction words, said decoder logic means including a branch instruction detection means for detecting when one of said instruction words is a branch instruction word; and

(d) a branch logic system for setting said program counter to the address indicated by the instruction word stored in the sequential memory location immediately following the memory location wherein said detected branch instruction word is stored in response to the detection of said branch instruction word by said branch instruction detection means.

4,287,560
DUAL MODE MICROPROCESSOR SYSTEM

Brian K. Forbes, Huntington Beach, and Robert D. Catiller, Garden Grove, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 27, 1979, Ser. No. 52,479
Int. Cl.³ G06F 3/04
U.S. Cl. 364—200 **10 Claims**



1. A universal-type microprocessor system which cooperates with an application-dependent logic module to form a peripheral-controller capable of handling data transfers between main memory of a host computer and a plurality of peripheral terminal units which can be either "word-oriented" or "byte-oriented", and wherein said application-dependent logic module provides external register means having bus connections to said plurality of peripheral terminal units and to said host computer, and wherein said application-dependent logic module further includes an external memory for storage of programs related to control of said peripheral terminal units and for temporary storage of data undergoing transfer, and wherein said application-dependent logic module further includes control logic means for communicating with and controlling said external register means, said external memory and communicating with a decoder-controller in said microprocessor system, the said microprocessor system comprising:

(a) data processing means including:

(a1) an Arithmetic Logic Unit providing an output to a shift logic circuit and to a byte-swap circuit;

(a2) said shift logic circuit providing output to an I/O bus, said shift logic circuit functioning to rotate one or more bits of a word being processed, to the right or to the left;

(a3) said byte-swap circuit providing output to said I/O bus, said byte-swap circuit functioning to exchange the sequential positions of the higher order byte and the lower order byte of a received two-byte word;

(b) said I/O bus providing connecting lines from said data processing means to said external registers, to said external memory, to an accumulator register means, and to an addressing means;

(c) said addressing means receiving input data from said I/O bus and storing addresses useful for accessing data from an

internal memory or said external memory, said addressing means including:

(c1) a program counter storing consecutive addresses of data located in said internal program memory;

(c2) a memory reference register for storing addresses of data located in said external memory, and including:

(c2-1) a memory address bus which connects to said external memory;

(c2-2) and wherein a dedicated non-address bit in each location in said memory reference being set to signal said decoder-controller to initiate a byte-swap operation in said byte-swap circuit, or when not-set, to pass data without a byte-swap operation;

(c2-3) a bus connection from said memory reference register to said decoder-controller;

(c3) an address register in said decoder-controller connecting by means of an address bus to accumulator register means which include a plurality of accumulator registers for selection of data from/to an one of said addressed accumulator registers;

(d) said internal program memory for storing program instructions and data words, said internal memory being addressed from said program counter and providing instruction words and data, via an instruction bus, to an instruction register and memory operand register, said program memory including:

(d1) instruction words wherein each word includes a field (M) which signals said decoder-controller to select either said program counter or memory reference register as source of the next address;

(e) register means for temporary storage of data, said register means including:

(e1) said plurality of addressable accumulator registers which provide an output to the input of said Arithmetic Logic Unit, said accumulator registers receiving input data words from said I/O bus;

(e2) said memory operand register for receiving operand data from said internal program memory via an instruction bus or from said external memory via a memory data bus;

(e3) said instruction register for receiving instruction words from said internal program memory via said instruction bus or from said external memory via said memory data bus, and providing instruction words to said decoder-controller;

(f) said instruction decoder-controller receiving instruction signals from said instruction register, and including incoming and outgoing control signal lines connected to said data processing means, to said addressing means, to said register means, to said internal and external memory means, to said external registers and said control logic means, said decoder-controller further including:

(f1) means for setting operations into one of two modes wherein a first mode, designated foreground mode, is for normal operations and a second mode, designated background mode, is for interrupt operations;

(g) an external memory data bus for carrying data from said external memory to said instruction register and said memory operand register;

(h) and wherein said plurality of addressable accumulator registers includes:

(h1) a first set of accumulator registers, designated as foreground accumulator registers, for use during normal operations; and

(h2) a second set of accumulator registers, designated as background accumulator registers, for use during interrupt operations;

(i) and wherein said decoder-controller includes: means to select an accumulator register in said first set or said second set according to whether the foreground mode or background mode is operating.

4,287,561

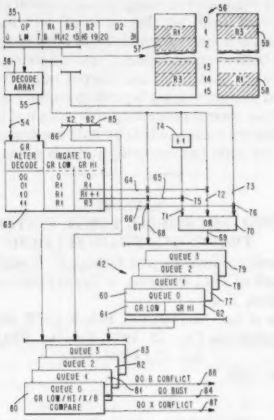
ADDRESS FORMULATION INTERLOCK MECHANISM

John S. Liptay, Rhinebeck, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 887,093, Mar. 16, 1978. This application Jul. 30, 1979, Ser. No. 62,200

Int. Cl.³ G06F 9/00

U.S. Cl. 364—200 **4 Claims**



1. In a data processing system having overlapped instruction execution and instruction decoding including: (1) a memory having a plurality of addressable locations, each location adapted to store either instructions or data; (2) an instruction preprocessing unit; (3) a plurality of addressable general registers; (4) an execution unit and; (5) means interconnecting said various units, said instruction preprocessing unit including, a program counter connected to the memory for addressing the memory, said memory connected to an instruction register, to access instructions in sequence for transfer to the instruction register, a normally operative decoder connected to the instruction register for decoding various fields of an instruction, each instruction including an OP code field specifying an operation to be performed, at least two general register address fields providing designation of, and access to, the general registers, with certain of the instructions including a data address field providing part of the address information required to address a memory location of data, the decoding process for a data accessing instruction including the combining of the data address field in an instruction with the information content of one or more general registers identified by one or more general register address fields of the instruction, an instruction which may be of the type called a general register modifying instruction when executed by the execution unit would include the transfer of new data to at least one general register, and a plurality of queue registers in the preprocessing unit comprising a first-in/first-out buffer connected to the output of the decoder, wherein as the decoding of each instruction in the instruction register is completed, signals, partially developed from the OP code field of the instruction, representing execution control information required by the execution unit are stored in one of said queue registers, and execution control information is transferred from the queue registers to the execution unit, one at a time, and on demand by the execution unit, each queue register having an associated busy trigger which is set when execution control information is received, and reset when the execution unit completes execution of the instruction represented by the execution control information,

improved interlock logic in associated with the instruction preprocessing unit for blocking operation of the instruction decoder comprising:

first (61) and second (62) general register identifying fields

included as part of, and completing the development of execution control information in, each of said plurality of queue registers (**60**, **77**, **78**, **79**);

gate means (**63** through **76**), operative at the completion of decoding of a general register modifying instruction, for transferring the one or more general register address fields identifying said at least one general register from said instruction register to said first and second general register identifying fields of the queue register which is associated with the execution control information developed in conjunction with that particular instruction, and having a busy trigger reset, as part of the execution control information,

a plurality of compare means (**80**, **81**, **82**, **83**) one for each of said first and second general register identifying fields of each of said queue registers;

means (**85**, **86**) connecting the one or more general register address fields of a data accessing instruction from the instruction register to all of said plurality of compare means; and

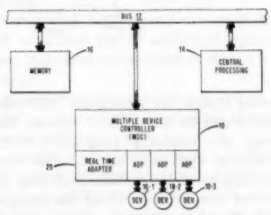
correspondence signalling means (**104**), connected and responsive to all said compare means for signalling (**105**) correspondence between a general register address field in a data accessing instruction and said first and second general register identifying fields in any of said queue registers, thereby indicating that the execution unit has not yet received from said queue registers, and executed, the execution control information of a previously decoded general register modifying instruction, said correspondence signalling means being connected to the normally operative decoder to inhibit further operation of the decoder.

4,287,562

REAL TIME ADAPTER UNIT FOR USE IN A DATA PROCESSING SYSTEM

Boyd E. Darden, St. Petersburg, Fla., and Henry F. Hartley, Lowell, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sep. 6, 1979, Ser. No. 73,058
Int. Cl.³ G06F *3/00*
U.S. Cl. 364—200 **31 Claims**



23. A data processing system including a central processing unit and a controller coupled in common to a bus, said controller having a number of ports for connecting a corresponding number of adapter units and including means for generating commands to said adapter units, one of said adapter units comprising:

a microprocessing section coupled to said controller for transferring and receiving signals from said controller, said section including:

a data bus;

an address bus;

a microprocessing unit coupled to said data bus and to said address bus;

random access memory having a plurality of storage locations, a number of said plurality of storage locations providing a transfer buffer, said random access memory being coupled to said data and address buses;

a programmable read only memory coupled to said address and data buses having a plurality of storage locations for storing a number of instruction control sequences;

a clock circuit coupled to said controller for receiving timing signals from said controller and being coupled to said microprocessing section, said clock circuit for generating timing signals for synchronizing at a microsecond rate the operations of said microprocessing section within said adapter;

a peripheral interface adapter circuit coupled to said data bus and to first and second bidirectional peripheral data buses, said peripheral interface adapter circuit including a pair of control registers, each coupled to said data bus and a different one of said first and second peripheral buses, each of said registers storing control information for separately controlling the direction of data for each line of the corresponding one of said peripheral data buses;

a time of day counter section coupled to said microprocessing section, said time of day counter section including:

a binary counter coupled to said first peripheral bus, said counter for storing a time of day value;

a free running clock circuit coupled to said binary counter for generating clock signals for updating said time of day value at a millisecond rate;

an output latching register coupled to said counter and to said data bus; and,

a decoder circuit coupled to said second peripheral bus and to said output latch register; and,

a selector circuit coupled to said address bus, to said output latch register and to an enable input terminal of said peripheral interface adapter circuit;

said microprocessing unit being operative in response to a command from said controller requesting the time of day to read out a predetermined one of said instruction sequences from said read only memory for generating a succession of address and data signals on said address bus and data bus respectively, said selector circuit being operative in response to said address signals to apply a signal on said enable input terminal of said peripheral interface adapter circuit for applying said data signals on said second peripheral bus to said decoder circuit, said decoder circuit in response to said data signals generating a series of output pulses for storing a predetermined number of time of day values read from said counter in said output latching register and said selector circuit being operative in response to other address signals generated by said microprocessing unit to generate a series of output pulse signals to condition said output latch register to transfer a predetermined byte of each predetermined number of said time of day values to said microprocessing unit for comparison to select the latest time of day value read from said binary counter not during an update operation for storage in said transfer buffer of said memory for subsequent transfer to said central processing unit in response to said read command.

4,287,563

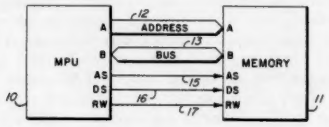
VERSATILE MICROPROCESSOR BUS INTERFACE

William D. Huston, Jr., Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 13, 1979, Ser. No. 93,408
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **2 Claims**

1. A versatile microprocessor bus interface for interfacing an external memory/peripheral to a first microprocessor or to a second microprocessor wherein the first microprocessor provides a first bus carrying high order address bits, a multiplexed bus alternately carrying data or lower order address bits, an address strobe signal which indicates when the multiplexed bus is carrying the lower order address, a data strobe signal which controls reading and writing data from the external memo-

ry/peripheral, and a read/write signal which indicates whether the mutliplexed bus is carrying read data or write data, and wherein the second microprocessor provides a second bus carrying high order address bits, a multiplexed bus alternately carrying data or lower order address bits, an address latch enable signal which indicates when the multiplexed bus is carrying the lower order address, a read signal which indicates by its complement when the multiplexed bus is to carry read data from the memory/peripheral, and a write signal which indicates by its complement when the multiplexed bus is carrying write data, the interface comprises: a



latch for receiving the data strobe signal or the read signal and being clocked by the address strobe signal or the address latch enable signal, the latch providing an output control signal; a first logic means providing a read enable signal when the data strobe and the read/write signals are both logic level highs or when the read signal is a logic level low, the read enable signal being gated through the first logic means by a control output of the latch; and a second logic means providing a write enable signal when the data strobe is a logic level high and the read/write signal is a logic level low or when the write signal is a logic level low, the write enable signal being gated through the second logic means by the output control of the latch.

4,287,564

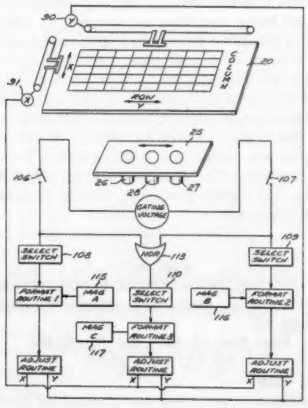
METHOD OF CORRECTING FOR MISALIGNMENT OF MICROFICHE FRAMES

William R. Swift, Placentia; Don W. Herrod, Walnut, and James M. Marsh, Yorba Linda, all of Calif., assignors to AM International, Inc., Los Angeles, Calif.

Division of Ser. No. 939,445, Sep. 5, 1978. This application Apr. 2, 1979, Ser. No. 25,974

Int. Cl.[3] G05D *3/18;* **G06F** *15/40;* **G03B** *27/48*

U.S. Cl. 364—525 **1 Claim**



1. The method of correcting for out of tolerance placement of frames in an array, the array having generally regularly spaced rows and columns, wherein a first stepper motor moves the array columnwise along a first axis, and a second stepper motor moves the array rowwise along a second axis, the frames of a correctly produced array being separated from each other by a nominal distance along each axis, the method comprising the steps of:

positioning the array such that a predetermined frame occupies a predetermined position, moving the array a distance corresponding to a number of steps made by one of the motors along one of the axes such that a frame farthest from said predetermined frame along the one of said axes occupies the predetermined position, dividing the number of steps made by the one of said motors during the preceding move by one less than the number of frames moved to obtain a quotient and adding the quotient to the nominal distance between frames along the axis moved to yield an average actual distance between frames along the axis moved, whereby the average actual distance is thereafter used in future positioning of selected frames of the array.

4,287,565

MONITORING SYSTEM FOR PROGRAM CONTROLLED APPARATUS

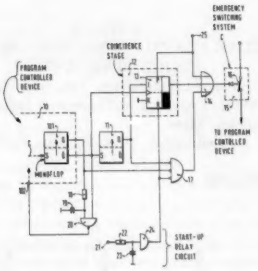
Georg Haubner, Berg; Jürgen Wesemeyer, Nurenberg; Hans Schrumpf, Oberasbach; Jörg Birmelin, Bretten; Manfred Schwab, Gerlingen; Günter Hönig, Ditzingen; Uwe Kiencke, Ludwigsburg; Alfred Schulz, Oberriexingen, and Werner Meier, Rednitzhembach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 1, 1979, Ser. No. 80,520

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1978, 2842392; Jan. 31, 1979, 2903638

Int. Cl.[3] G06F *11/04*

U.S. Cl. 364—580 **21 Claims**



1. Monitoring system for a program controlled device for operating systems in an automotive vehicle, the automotive vehicle having electronically program controlled devices which repetitively, cyclically control and cause operating events for the engine of the vehicle including at least one of ignition and fuel injection, in which the program control is effected by electrical program signals having characteristics defining the program, and said signals are subject to spurious noise and erroneous disturbance signals occurring in an automotive vehicle

in which the program controlled signals include cyclically recurring signal sequences which further include supervisory or monitoring check pulses,

said program controlled device (10) having a check pulse line or bus (C) on which the monitoring or check pulses appear, and said program controlled device controlling the repetitive occurrence of said at least one event,

comprising, in accordance with the invention,

a source of operating power for the program controlled device,

monitor means connected to said check pulse line or bus (C) and sensing regular recurrence of said check pulse, said monitor means being connected to and controlling the program controlled device to reset the program and commence a new program cycle upon failure to sense occur-

rence of the monitor or check pulse by said monitor means subsequent to a previously sensed check pulse, and

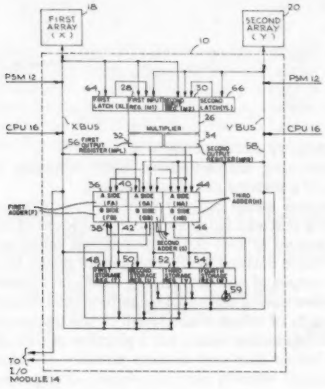
an emergency switching system (**15, 16**) coupling said operating power source to the program controlled device and having an input which, when energized, causes said emergency switching system to disconnect the operating power source from the program controlled device to disable the program controlled device.

4,287,566

ARRAY PROCESSOR WITH PARALLEL OPERATIONS PER INSTRUCTION

Glenn J. Culler, Santa Barbara, Calif., assignor to Culler-Harrison Inc., Goleta, Calif.

Filed Sep. 28, 1979, Ser. No. 80,032
Int. Cl.³ G06F *9/28, 15/16, 7/52*
U.S. Cl. 364—754 **11 Claims**



1. An array processor comprising:

multiplication means;

multiplication input means to said multiplication means, said multiplication input means comprising first and second input registers;

first and second latch means each of which is operatively connected to at least one of said input registers;

output means from said multiplication means;

storage means;

addition and subtraction means responsive to contents of said multiplication output means and said storage means;

first and second arrays;

means for providing signal inputs from said first and second arrays to said multiplication input means, said storage means, and said addition and subtraction means; and

interconnection means allowing selected multiplication, storage, addition and subtraction, and transfer operations to occur in parallel in response to predetermined input instructions, said interconnection means comprising means for connecting said first latch means to said first array and said second latch means to said second array.

4,287,567

HIGH SPEED CENTRAL OFFICE SCANNER

James R. Lumsden, Edmonton, Canada, assignor to Universal Industrial Control Devices Ltd., Edmonton, Canada

Continuation-in-part of Ser. No. 911,670, Jun. 1, 1978, abandoned. This application Jul. 31, 1979, Ser. No. 62,529
Int. Cl.³ G06F *15/16;* **H04Q** *3/54*
U.S. Cl. 364—900 **9 Claims**

1. A high speed central office scanner for communicating with a plurality of transponding units connected by telephone lines; said scanner is comprised of:

A. N, I/O means, where N is a positive integer, each I/O means comprising:

(a) multiplex means for connecting said I/O means to M telephone lines, each telephone line being connected to at least one transponder, where M is a positive integer;

(b) a microprocessor;

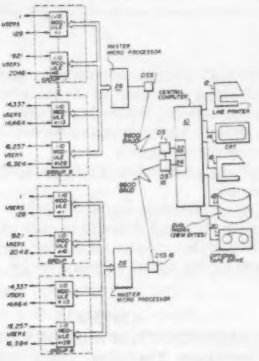
(c) multiplex logic means, controlled by said microprocessor for sequentially selecting one of said M telephone lines;

(d) a bush detect means for checking said selected line and producing a signal when said selected line is busy;

(e) transmitting-receiving means connected to said selected line, controlled by said microprocessor for transmitting an instruction code to a transponder connected thereto when said signal is absent, and receiving data from said transponder in response to said instruction code;

(f) storage means; and

(g) I/O interface logic means,



wherein said microprocessor analyzes the received data and enters the received data in said storage means if the received data satisfies a predetermined criterion;

B. master microprocessor means comprising:

(a) interface logic means connected with said I/O interface logic means of each of said N, I/O means;

(b) a main microprocessor for sequentially selecting one of said N, I/O means and for generating an interrogation code for transmission to each selected I/O means to enquire if said selected I/O means has received data stored therein;

(c) main storage means for storing received data from said selected I/O means; and

(d) main transmitting-receiving means for transmitting said received data stored in said main storage means upon receipt of a further interrogation code;

wherein each said N, I/O means scan said M telephone lines independently and asynchronously with respect to each other of said N, I/O means and said master microprocessor means.

4,287,568

SOLID STATE MUSIC PLAYER USING SIGNALS FROM A BUBBLE-MEMORY STORAGE DEVICE

Robert W. Lester, 46 Abbey Rd., Munsey Park, Manhasset, N.Y. 11030

Continuation-in-part of Ser. No. 801,945, May 31, 1977, abandoned. This application Aug. 6, 1979, Ser. No. 64,454
Int. Cl.³ G06F *15/20;* **G11C** *19/08, 5/02;* **G10H** *1/00*
U.S. Cl. 364—900 **10 Claims**

1. A solid state music player for reproducing and playing stored digital information from a magnetic bubble-memory device having exposed terminals, comprising:

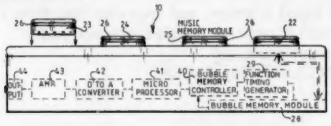
a bubble-memory module for receiving the bubble-memory device, which contains the stored program;

a function [illegible]ing generator, which is coupled to said bubble-

memory module for generating control and timing signals for said module;

a bubble-memory controller coupled to said function-timing generator and said bubble-memory module;

a microprocessor coupled to said bubble-memory controller the bubble-memory controller responding to commands from the microprocessor, to send control signals to the function-timing generator, necessary to access the digital data stored in the module, and reading stored digital information from said bubble-memory module, the controller performing a serial-to-parallel conversion of the stored data as the data is transmitted from said module to said microprocessor;



a digital-to-analog converter coupled to said microprocessor for converting the stream of digital information from the microprocessor into the analog signals;

amplifier means coupled to said converter for amplifying the converted analog signals;

a housing having a plurality of receptacles disposed in its top surface; and

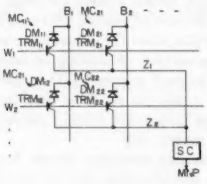
a plurality of electrical contacts coupled to said bubble-memory module and disposed in each of said receptacles along its peripheral walls, for contact with corresponding terminals on the bubble-memory device.

4,287,569

SEMICONDUCTOR MEMORY DEVICE

Toshitaka Fukushima, Yokohama, Japan, assignor to Fujitsu Limited, Japan

Filed Sep. 7, 1979, Ser. No. 73,486
Claims priority, application Japan, Sep. 8, 1978, 53-110503
Int. Cl.[3] G11C *11/36, 17/06*
U.S. Cl. 365—96 **10 Claims**



1. A semiconductor memory device comprising:

a plurality of bit lines;

a plurality of word lines;

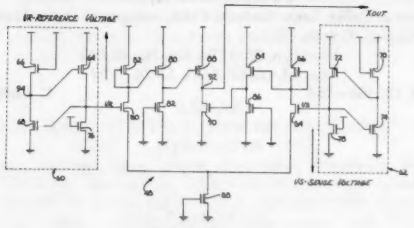
a plurality of memory cells operatively connected to and located at a cross position of said plurality of bit lines and said plurality of word lines, wherein each of said memory cells comprises an information storing element having a first terminal and a PNP type transistor connected in series with said information storing element, wherein said PNP type transistor comprises a P type semiconductor substrate, having a surface, forming the collector region; an N type epitaxial layer, formed on the surface of said P type semiconductor substrate, forming the base region; and a P type region, formed in said N type epitaxial layer, forming the emitter region, wherein said first terminal of said information storing element is operatively connected to one of said plurality of bit lines, wherein the base region of said PNP type transistor is operatively connected to one of said plurality of word lines, and wherein the collectors of the PNP type transistor of each of said plurality of memory cells are operatively connected at a node.

4,287,570

MULTIPLE BIT READ-ONLY MEMORY CELL AND ITS SENSE AMPLIFIER

Moshe Stark, Haifa, Israel, assignor to Intel Corporation, Santa Clara, Calif.

Filed Jun. 1, 1979, Ser. No. 44,762
Int. Cl.[3] G11C *17/00, 7/06*
U.S. Cl. 365—104 **1 Claim**



1. A memory circuit comprising:

characterizing source-to-drain width assuming a selected one of a discrete plurality of values;

comparator means coupled to said circuit device for comparing said selected one value of said width of said transistor against at least one predetermined value; and

logic means coupled to said comparator means for decoding the output of said comparator means into a number, said number having maximum magnitude equal to said discrete plurality of values of said width of said transistor, wherein said comparator means has a plurality of outputs one less in number than said discrete plurality of values of said transistor wherein each said output corresponds to a predetermined value, each said predetermined value being nested between two of said discrete plurality of values of said width of said transistor; and

wherein said comparator means includes a differential amplifier to compare said selected one of said discrete plurality of values of said width of said transistor against said predetermined value wherein said sense amplifier is comprised of a biased reference inverter, a biased sense inverter, a reference voltage source, a sense voltage source coupled to said field effect transistor, and an output amplifier, said sense voltage and reference voltage sources being substantially identical in circuit design and coupled to said biased inverters, said sense inverter coupled to said sense voltage source and said reference inverter coupled to said reference voltage source, said sense and reference inverters being coupled to the inputs of said output amplifier whereby analog voltages are analyzed by said comparator means to reliably produce digital voltage levels independent and self-compensating for changes in temperature, voltage, dimension and process variations;

whereby a memory circuit may be devised having more than two states for each memory cell.

4,287,571

HIGH DENSITY TRANSISTOR ARRAYS

Satya N. Chakravarti, Troy, N.Y., and John A. Hiltebeitel, South Burlington, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

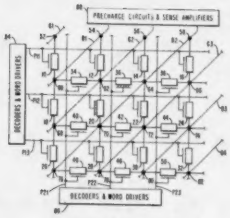
Filed Sep. 11, 1979, Ser. No. 74,272
Int. Cl.[3] G11C *17/00, 11/40*
U.S. Cl. 365—104 **24 Claims**

1. A transistor array comprising:

a semiconductor substrate of a first conductivity having a given surface region and a plurality of surface regions of a

second conductivity opposite to that of said first conductivity,

a plurality of first conductivity lines insulated from said substrate and arranged to define said given surface region and said plurality of surface regions, said given surface region being formed within an area defined on all sides by said plurality of conductive lines, and



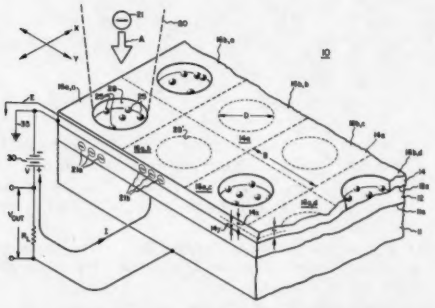
a plurality of second conductive lines, one of said second conductive lines being connected to said given surface region and the remaining lines of said plurality of second lines being connected to said plurality of surface regions, whereby a plurality of transistors is formed having a common current carrying electrode.

4,287,572

METHOD FOR WRITING ON ARCHIVAL TARGET AND TARGET PRODUCED THEREBY

Harold F. Webster, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 22, 1979, Ser. No. 68,680
Int. Cl.[3] G11C *11/26*
U.S. Cl. 365—128 **17 Claims**



1. A method for archival memory recording of data, comprising the steps of:

(a) providing a semiconductor substrate having a surface;

(b) fabricating a layer of insulative material upon said semiconductor substrate surface;

(c) selecting a conductive material which does not, when molten, wet the surface of the insulative layer;

(d) fabricating a layer of the selected non-wetting material upon the insulative material layer surface furthest from the substrate;

(e) assigning a two-dimentional array of potential data storage sites upon the surface of the masking layer furthest from said insulative layer;

(f) directing a beam of electrons sequentially to each of at least a portion of the array of potential data storage sites;

(g) imparting sufficient energy to the electrons of said beam to melt the material of said masking layer when said beam impinges at each data storage at which a first binary value of data is to be stored; and

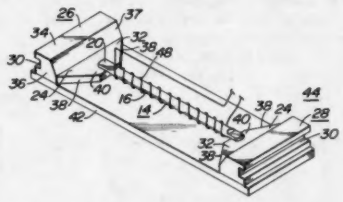
(h) imparting another value of energy to the electrons of said beam, insufficient to melt the material of said masking layer, when said beam impinges at others of the potential data storage sites of said array at which a remaining value of binary data is to be stored.

4,287,573

METHOD AND MEANS FOR COUPLING AN ELONGATED MAGNETIC DEVICE

Richard A. Lathlaen, Hatfield, Pa., assignor to TRW, Inc., Cleveland, Ohio

Filed Aug. 7, 1978, Ser. No. 931,924
Int. Cl.[3] G11C *11/155*
U.S. Cl. 365—133 **42 Claims**



1. A method for coupling an elongated magnetic device to a magnetic circuit comprising the steps of

shaping the ends of an elongated magnetic device to provide a high ratio of surface area to volume and a contact surface at each end,

positioning and spacing the ends of a pair of members of a flux conductive means with respect to each other and securing them with a supporting means, and

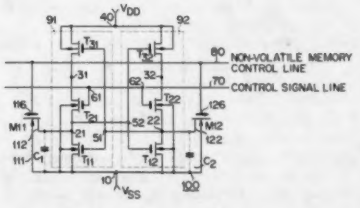
connecting the contact surface of each end of said magnetic device to a conforming portion of a respective one of the pair of spaced ends of the flux conductive means to provide a magnetic path through said conductive means and magnetic device and connections of high permeability and low coercivity therebetween.

4,287,574

MEMORY CELL WITH NON-VOLATILE MEMORY ELEMENTS

Yukimasa Uchida, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 28, 1979, Ser. No. 70,394
Claims priority, application Japan, Sep. 20, 1978, 53-114577
Int. Cl.[3] G11C *11/40*
U.S. Cl. 365—156 **26 Claims**



1. A memory circuit having non-volatile memory cells each with a bistable circuit including a couple of series each connected in such a way that first and second insulated gates transistors of the first channel type and a third gate transistor of the second channel type are connected in series fashion, a common connection part is provided commonly connecting the gates of the first and third insulated gate transistors, a control signal is applied to the gate of the second insulated gate

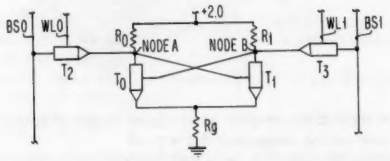
transistor through a control signal line, separate from said common part, and an output part is provided which is a connection part connecting the first or third insulating gate transistor and the second insulated gate transistor, the connection part of one of the series circuit being connected to the output part of the other series circuit while the output part of the former, to the connection part of the latter, wherein a nonvolatile memory element is connected to the connection part of said first and second insulated gate transistors of one of said series circuits.

4,287,575

HIGH SPEED HIGH DENSITY, MULTI-PORT RANDOM ACCESS MEMORY CELL

David B. Eardley, Stanfordville, and Richard E. Matick, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1979, Ser. No. 108,070
Int. Cl.[3] G11C *11/40*
U.S. Cl. 365—174 **5 Claims**



1. In a random access memory system comprising a plurality of bit storage cells any two of which are individually addressable during a reading operation to simultaneously provide to first and second sense amplifiers, signals corresponding to the binary value of the data stored in said cells at said two addressed locations, said locations being defined by two separate address signals;

each of said cells comprising a first pair of cross-coupled transistors having their respective emitters connected to ground through a common resistor and their respective collectors connected to a predetermined voltage source through associated resistors, whereby two control nodes are established for controlling which of said transistors is placed in a conducting state, the improvement comprising in combination:

first and second input/output transistors each having its emitter connected to a different control node,

a pair of word lines for each row of said matrix and a pair of sense lines for each column of said matrix,

means connecting one of said pair of said word lines associated with each row to the base of each said first input/output transistor in said row, and the other word line of said pair of word lines to the base of each of said second input-/output transistors in said row,

means connecting one of said pair of sense lines associated with each column to the collector of each of said first input/output transducers in said column, and the other one of said pair of sense lines associated with said column to the collector of each said second input/output transistor in said column,

means for pulsing one of said word lines connected to the base of said first input/output transistor and means for simultaneously pulsing one of said word lines connected to the base of said second input/output transistor whereby each cell in the row associated with said pulsed word line connected to the base of said first input/output transistors causes a change in signal level on the sense line associated with said first input/output transistor if said cell contained one binary value and no change in signal level if said cell contained the other binary value, and each cell in the row associated with said pulsed word line connected to said second input/output transistor causes a change in signal level of the sense line associated with said second input-/output transducer if said cell contains said other binary value and no change in signal level if said cell contained said one binary value, and if said cell contained said one binary value, and

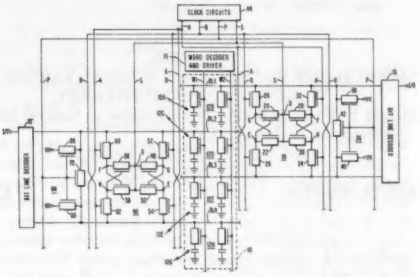
means responsive to said first and second address signals for selecting one first and second sense line to be sensed.

4,287,576

SENSE AMPLIFYING SYSTEM FOR MEMORIES WITH SMALL CELLS

Wilbur D. Pricer, Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 26, 1980, Ser. No. 134,259
Int. Cl.[3] G11C *11/40*
U.S. Cl. 365—203 **10 Claims**



9. A memory comprising;

an array including;

first, second, third and fourth consecutively and parallelly arranged bit lines, a plurality of parallel word lines arranged orthogonal to said bit lines and a cell disposed at the intersection of each of said bit and word lines,

a first sense amplifying system;

first and second tandemly arranged differential amplifiers connected to the ends of said first and third bit lines at one edge of said array,

first means including a first pair of isolation devices for selectively coupling said first differential amplifier to said first and third bit lines,

second means including a second pair of isolation devices for selectively coupling said second differential amplifier to said first and third bit lines, and

third means for establishing a reference potential coupled to said first and third bit lines, and

a second sense amplifying system including;

third and fourth tandemly arranged differential amplifiers connected to the ends of said second and fourth bit lines at an edge of said array opposite to that of said one edge,

fourth means including a third pair of isolation devices for selectively coupling said third differential amplifier to said second and fourth bit lines,

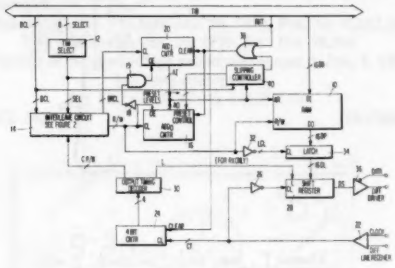
fifth means including a fourth pair of isolation devices for selectively coupling said fourth differential amplifiers to said second and fourth bit lines, and

sixth means for establishing said reference potential coupled to said second and fourth bit lines.

4,287,577
INTERLEAVED TDMA TERRESTRIAL INTERFACE BUFFER

Joseph H. Deal, Jr., Clarksburg, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Sep. 27, 1979, Ser. No. 79,681
Int. Cl.³ G11C *8/00*
U.S. Cl. 365—233 **19 Claims**



1. A buffer memory system comprising:

a Random Access Memory (RAM) having a data input terminal for receiving input data to said RAM, a data output terminal for providing output data from said RAM, an address input terminal for receiving signals indicative of address locations within said RAM and a read/write input terminal for receiving read and write signals, said memory storing said input data at an input address location in response to a write signal and an input address signal and providing output data from an output address location in response to an output address signal and a read signal;

input address means for providing an input address to said address input terminal in response to an enabling signal;

output address means for providing an output address to said address input terminal in response to an enabling signal;

enabling means for providing nonoverlapping enabling signals to said input and output address means to thereby multiplex said input and output address signals onto said address input terminal; and

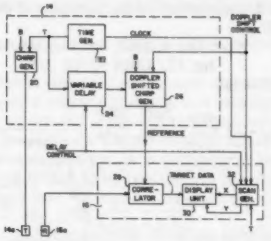
read/write means synchronized with said enabling means for providing non-overlapping read and write signals to said read/write terminal.

4,287,578
METHOD FOR SHAPING AND AIMING NARROW BEAMS

Richard C. Heyser, Tujunga, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 7, 1979, Ser. No. 92,143
Int. Cl.³ G01S *15/04, 15/89*
U.S. Cl. 367—88 **12 Claims**

1. In a process for transmitting a beam of frequency chirped wave energy, and for both receiving chirped wave energy from targets having relative motion and for correlating time delayed chirped wave energy with received chirped wave energy, a method of synthesizing a narrow beam from otherwise broadbeam wave energy by so controlling the frequency bandwidth, B, and the time, T, of transmitted chirps that for a narrower beamwidth under given conditions the time-bandwidth product, TB, is increased, and producing time delayed

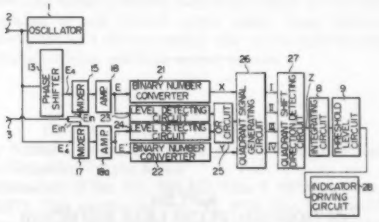


replicas of transmitted chirps for correlation with received chirps.

4,287,579
MOVING OBJECT DETECTING DEVICE

Hiromitsu Inoue, Kyoto; Hiroshi Ohashi, Hirakata, and Mikio Kondo, Tsu, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Nov. 8, 1979, Ser. No. 92,487
Claims priority, application Japan, Aug. 11, 1978, 53-137454
Int. Cl.³ G01S *15/04*
U.S. Cl. 367—94 **6 Claims**

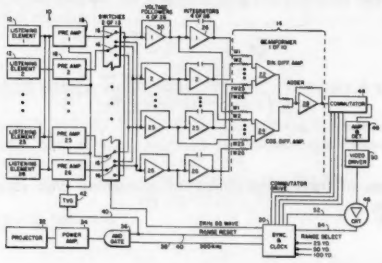


1. A moving object detecting device comprising an oscillator, a radiating-wave transducer, a received-wave transducer receiving reflected waves from a moving object and converting said reflected waves to a received-wave signal, a mixing means for converting said received-wave signal to a pair of vector signals, a pair of binary number converters converting said pair of vector signals to a pair of binary numbers, a quadrant signal generating circuit generating a quadrant signal depending on said pair of binary numbers, a quadrant shift direction detecting circuit generating one of shift direction signals of positive and negative voltages corresponding to a vector shifting direction based on a pair of signals including informations on said quadrant signal, an integrating circuit integrating said shift direction signal, a threshold level circuit detecting output levels of said integrating circuit, and an indicator driving circuit driven by an output of said threshold level circuit, the presence of said moving object being detected by judging shifting direction of respective quadrants through which the vector of the received-wave signals pass.

4,287,580
MINIATURIZED SCAN WITHIN A PULSE SONAR

Jack E. Holzschuh, Kailua, Hi., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 4, 1980, Ser. No. 109,940
Int. Cl.³ G01S *15/42, 3/84*
U.S. Cl. 367—105 **9 Claims**



1. In a scanning sonar the improvement comprising:

a line array of N listening transducer elements, each listening element being capable of receiving an acoustic signal and outputting a corresponding electrical signal;

a plurality of beamformers, each beamformer having an input and an output, the input of each beamformer receiving the outputs of the listening elements; and

switch means interconnected between the listening elements and the beamformers for alternately switching the outputs of the listening elements to each beamformer between two modes, one mode being a predetermined order and the other mode being an inversion of said predetermined order.

4,287,581
ULTRASONIC FLUID LEAK DETECTOR

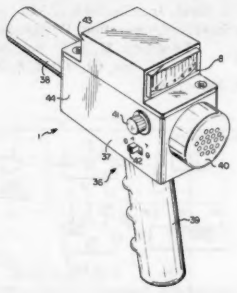
Dory J. Neale, Sr., 3710 Shore Acres Blvd., St. Petersburg, Fla. 33703

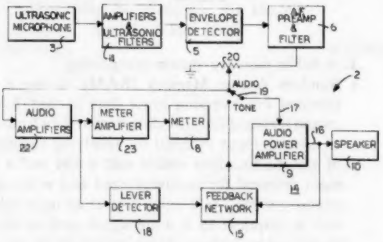
Filed Feb. 19, 1980, Ser. No. 122,584
Int. Cl.³ G01M *3/24*
U.S. Cl. 367—135 **14 Claims**

1. In a device for detecting ultrasonic noise including a microphone responsive to ultrasonic frequencies, ultrasonic amplifier means connected to said microphone and including filter means responsive to a selected range of ultrasonic frequencies, audio frequency signal means providing an audio frequency envelope signal having characteristics of the ultrasonic noise received, an audio power amplifier connected to said audio frequency signal means, and speaker means connected to said audio power amplifier to convert the amplified audio frequency signal to sound, the improvement comprising:

(a) level detector means operatively connected to said audio frequency signal means and operative to provide a control signal having a level proportional to the amplitude of said audio frequency envelope signal; and

(b) alarm means connected to said audio power amplifier and said level detector means and operable upon said control signal exceeding a selected level and in cooperation with said audio power amplifier to trigger an alarm signal and



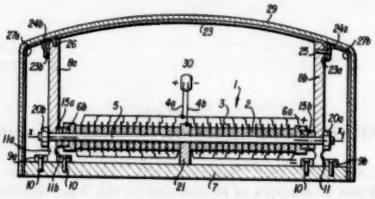


emit an audible indication of the detection of said ultrasonic noise.

4,287,582
PIEZO TRANSDUCERS WITH MECHANICAL AMPLIFICATION FOR VERY LOW FREQUENCIES, AND ACOUSTIC ANTENNAS

Bernard Tocquet, Sanary-sur-Mer, France, assignor to Etat Francais represente par le Delegue General pour l'Armement, Paris, France

Filed May 8, 1979, Ser. No. 37,055
Claims priority, application France, May 8, 1978, 78 13466
Int. Cl.³ H04R *17/00*
U.S. Cl. 367—163 **9 Claims**



1. A low frequency piezoelectric transducer for receiving and transmitting acoustic waves in water comprising:

at least one stack of piezoelectric elements having two axially opposite ends;

two levers placed on opposite sides of said stacks so that each of the two ends of each stack rests against one of the two levers near a point of support of one end of each of said levers;

a rigid base plate on which said one end of the two levers are supported;

and a horn formed of a flexible elastic diaphragm connecting together the remaining ends of the two levers.

4,287,583

CONTROL PANEL UNIT AND TIMER UNIT AND METHOD THEREFOR

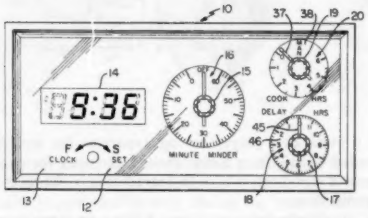
Robert Strachan, Walcott, and Carl J. Goodhouse, Litchfield, both of Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 872,610, Jan. 26, 1978, Pat. No. 4,182,112. This application Jul. 20, 1979, Ser. No. 59,244

The portion of the term of this patent subsequent to Jan. 8, 1997, has been disclaimed.

Int. Cl.³ G04B *47/00*; G04F *8/00*

U.S. Cl. 368—10 **14 Claims**



1. A method of operating a control panel unit for a cooking apparatus or the like and having a clock construction for indicating the time of day and a timer control means for selecting a delay time period and a cooking time period for causing said apparatus to provide a cooking operation for said cooking time period following the elapsing of said delay time period, said clock construction comprising an electronic clock means that has a liquid crystal time of day indicating means, said timer control means comprising electromechanical means that operate independently of said electronic clock means, said method comprising the steps of setting said timer control means to a desired delay time interval from the observed actual time of day on said clock construction based upon a selection of a number of increments of time from said observed actual time that the cooking operation is to begin, and, thereafter, setting said timer control means to a desired cooking time interval based upon a selection of a number of increments of time that the cooking operation is to last from the elapsing of said delay time period.

4,287,584

SPEECH-SYNTHESIZER TIMEPIECE

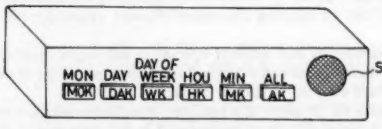
Akira Tanimoto, Kashihara, and Mituhiro Saizi, Kyoto, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 7, 1979, Ser. No. 18,174

Claims priority, application Japan, Mar. 25, 1978, 53-34681

Int. Cl.³ G04B *21/08*

U.S. Cl. 368—63 **5 Claims**



1. A speech synthesizer timepiece capable of producing audible sounds indicative of updated time and updated calender information, comprising,

means for producing said updated time and updated calendar information and for developing time information output signals and calender information output signals indicative, respectively, of said updated time information and said updated calender information;

input means for selecting desired time information or desired calender information for audible sound producing purposes;

memory means for storing a plurality of sound-related codes therein;

a first voice initial address circuit means responsive to said time information output signals and said calender information output signals and to the selection made via said input means for developing a first set of voice initial addresses representative of the location in said memory means storing the sound-related codes indicative of at least a portion of the desired time or calender information selected via said input means;

a second voice initial address circuit means responsive to the selection made via said input means for developing a second set of voice initial addresses representative of the location in said memory means storing the sound related codes indicative of an adjective phrase describing the body of the desired time or calendar information;

locating means responsive to said first and second set of voice initial addresses from said voice initial address circuit means for locating selected ones of said sound-related codes in said memory means, said memory means generating first and second output signals in a predetermined order in response thereto, said first output signals from said memory means representing said desired time or calendar information, each of said second output signals from said memory means being developed subsequent to the development of a corresponding one of said first output signals and representing said adjective phrase describing the body of said desired time or calendar information represented by said corresponding one of said first output signals; and

audible sound generation means responsive to said first and second output signals from said memory means for developing audible sounds in accordance with said first output signals from said memory means and for developing audible sounds in accordance with said second output signals from said memory means, each said audible sounds corresponding to said second output signls being developed subsequent to a corresponding one of the audible sounds developed from said first output signals.

4,287,585

CHRONOGRAPH WRISTWATCH

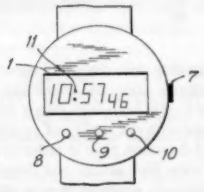
Hitomi Numabe, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation of Ser. No. 404,452, Oct. 9, 1973, Pat. No. 3,992,871. This application Nov. 22, 1976, Ser. No. 744,056

Claims priority, application Japan, Oct. 9, 1972, 49/101231

Int. Cl.³ G04C *19/00*; G04F *8/00*

U.S. Cl. 368—82 **1 Claim**



1. An electronic timepiece comprising oscillator means for generating relatively high frequency time standard signals; chronographic divider means coupled to said oscillator means and adapted to produce low frequency chronographic signals representative of elapsed time in response to said time standard signals; timekeeping divider means coupled to said oscillator

means and adapted to produce low frequency timekeeping signals representative of present time in response to said time standard signals; selector circuit means coupled to said chronographic divider means for receiving said chronographic signals and to said timekeeping divider means for receiving said timekeeping signals, said selector circuit means having an output to which one of said chronographic signals and timekeeping signals are selectively applied; and digital display means coupled to the output of said selector circuit means, said digital display means including display elements for displaying one of an elapsed time and lap time in response to said chronographic signal being supplied by said selector circuit means and present time in response to said timekeeping signals supplied by said selector circuit means, said display means including further visual indication means, said further visual indication means being selectively disposed to a preselected visual mode representative of the selective coupling of said chronographic divider means output to said digital display means to display lap time and the continued counting of elapsed time of said chronographic divider means, said further visual indication means including at least one dot in the region of, but not forming a part of, the digital display of time, said dot being flickered when said display means is selectively coupled to the chronographic divider means.

4,287,586

SIGNALING TIME DETECTING DEVICE FOR LEAF TYPE DIGITAL CLOCK

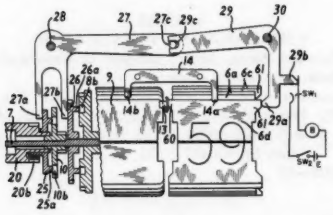
Masuo Ogihara; Kozo Chimura; Nobuo Shinozaki, and Yoichi Seki, all of Shikawatashi, Japan, assignors to Seiko Koki Kabushki Kaisha, Tokyo, Japan

Filed Dec. 27, 1979, Ser. No. 107,517

Claims priority, application Japan, Dec. 28, 1978, 53/163740; Dec. 28, 1978, 53/163741

Int. Cl.³ G04B *19/02;* G04C *21/16*

U.S. Cl. 368—222 **8 Claims**



1. In a signaling time detecting device for a leaf type digital clock, including a hour time wheel and a detection plate which corresponds to said hour time wheel and whose phase changes in accordance with the setting of an alarm signaling time so as to move said detection plate in order to actuate an alarm device when said hour time wheel and detection plate are brought into coincidence in phase with each other, said time detecting device comprising: a first detecting lever adapted to cooperate with said detection plate; a projection provided on each of some of a plurality of minute leaves, said some leaves occurring at a constant interval; a second detecting lever adapted to cooperate with any one of the projections and to be driven by said first detecting lever; and a switch adapted for rendering the alarm device operable in response to the action of either said first or second detecting lever.

4,287,587

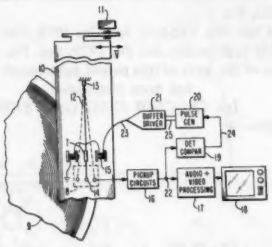
SIGNAL LOSS DECTECTOR FOR VIDEO DISC

Elvin D. Simshauser, Columbus, and Richard W. Nosker, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 7, 1980, Ser. No. 128,235

Int. Cl.³ G11B *3/58*

U.S. Cl. 369—50 **7 Claims**



1. In a video disc player having apparatus for recovering prerecorded signals from a disc record, circuitry for generating a control signal responsive to degradation in the recovered signal comprising:

signal amplitude detector means having an input terminal connected for receiving said recovered signal, and having an output terminal, wherein the time constant at the output terminal thereof is long compared with cyclical changes of the recovered signal;

divider means connected to the output terminal of the detector means for proportioning the signal thereat, the rate of change of the proportioned signal being long compared to the rate of change of the detector means output signal;

comparator means having a first input terminal connected for receiving the proportioned signal and a second input terminal connected for receiving the detector means output signal, and having an output terminal for providing a control signal, said control signal from the comparator means being normally at a first output signal level but changing to a second level when the signal level at its second input terminal falls below the signal level at its first input terminal.

4,287,588

MULTIPLE ACCESS, TIME-DIVISION MULTIPLEX, SATELLITE COMMUNICATIONS SYSTEM

Samuel M. Segner, West Long Branch, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 12, 1979, Ser. No. 29,182

Int. Cl.³ H04L *5/14;* H04B *7/26*

U.S. Cl. 370—29 **8 Claims**

1. A time-division, multiple access satellite communications system comprising at least one orbiting satellite repeater and n ground stations, $n \geq 2$, communicating with each other via said satellite, each of said ground stations including a transmitter, a receiver and an antenna connected thereto, characterized in that:

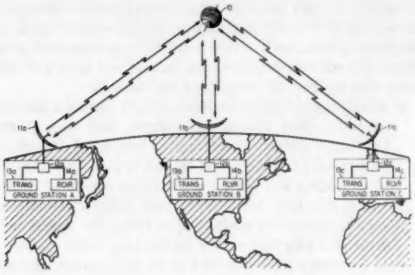
said transmitter and receiver operate in full duplex mode on the same uplink and downlink frequency, and each of said ground stations further comprises:

(a) means for processing a plurality of information channels for transmission as a compressed pulse sequence to the remaining (n-1) ground stations in said system, each of said information channels having priorly been sampled and digitized;

(b) first means for multiplexing said plurality of information channels into a sequence of digital samples for transmission in the one or more time slots allocated to that ground station in a transmission frame or epoch having a duration,

on the average, n times greater than the duration of said sequence, the sequence generated by each multiplexing means in said system occupying a unique, non-overlapping segment of said transmission frame or epoch;

(c) means for modulating said transmitter with the output of said multiplexing means; and



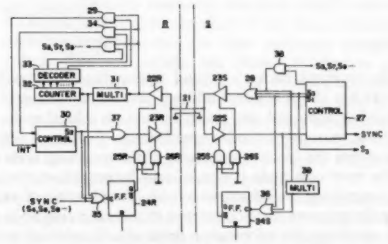
(d) means interposed between said antenna and the output of said transmitter, for enabling said transmitter for transmission to said satellite only during the time duration of the corresponding sequence of digital samples.

4,287,589

TRANSMISSION-RECEPTION APPARATUS

Hiroya Nakamura, Kunitachi, and Yasuhide Nishida, Hachioji, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 15, 1979, Ser. No. 66,528
Int. Cl.³ H04L *5/16*
U.S. Cl. 370—31 **3 Claims**



1. Transmission-reception apparatus comprising a pair of stations connected by a single transmission channel, each of said stations being capable of operating in a receiving mode in which it accepts inputs from the other and in a transmitting mode in which it emits inputs to the other, at least one of said stations being capable of receiving and processing information signals transmitted to it by the other station, said apparatus being characterized by:

A. said one of said stations having control means for emitting successive synchronizing pulses at regular intervals;

B. said one station further having means comprising gate means for transiently converting said one station from its receiving mode to its transmitting mode during the emission of each synchronizing pulse;

C. said other station having means comprising a monostable multi-vibrator and gate means

(1) for maintaining said other station in its transmitting mode for a period which begins upon receipt by said other station of each synchronizing pulse and which has a predetermined duration that is not longer than the interval between successive synchronizing pulses,

(2) for converting said other station to its receiving mode upon termination of each said period, and

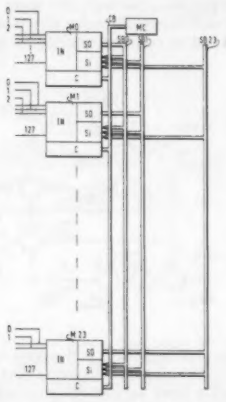
(3) for emitting an information signal during each said period.

4,287,590

TIME DIVISION MULTIPLEX COMMUNICATION SYSTEM

Raymond T. G. Boute, Antwerp; Wilfried L. J. De Kinder, Kalmthout; Gustaaf W. T. Neutjens, Hoboken; Andre G. G. Pochet; Jan P. M. Vanderschoot, both of Antwerp, and Jacques D. A. Van Remortel, Bazel, all of Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 25, 1979, Ser. No. 51,767
Int. Cl.³ H04Q *11/04*
U.S. Cl. 370—59 **12 Claims**



3. Time Division Multiplex (TDM) communication system including a plurality of TDM busses able to exchange signals through time slots on said busses and each time slot being divided into a number of time intervals, the invention in which the system is comprised of a plurality of modular units interconnected by said busses, each bus being connected to a plurality of terminal circuits, each unit including a signal processor, a space switch and a time switch, the space switch including means for forwarding during successive time intervals of a time slot, successive communication samples from distinct busses towards a time switch for shifting all said samples to another time slot and under the control of the signal processor individual to the unit, and wherein said signal processors are interconnected through a common control bus via which control information is interchanged between said processors.

4,287,591

COMMUNICATIONS TRANSMISSION SYSTEM

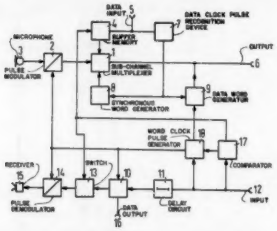
Herbert Strehl, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 20, 1979, Ser. No. 50,327
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1978, 2827040
Int. Cl.³ H04J *3/16*
U.S. Cl. 370—83 **1 Claim**

1. In a communications transmission system of the type in which pulse modulated analog signals and digital signals are transmitted between subscriber stations over a transmission medium, the improvement therein in which a subscriber station comprises:

a speech microphone

a speech receiver;
a data input for receiving data;
a data output for emitting data;
a station output for connection to the transmission medium;
a station input for connection to the transmission medium;
a pulse modulator having a first input connected to said microphone, a second input and an output;
a sub-channel multiplexer having a first input connected to said pulse modulator, a second input, a third input, and an output connected to said station output;
a buffer memory having a first input connected to said data input, a second input and an output connected to said second input of said sub-channel multiplexer;
a data clock pulse recognition circuit having an input connected to said data input, and an output;
a synchronous word generator having an input connected to said output of said data clock pulse recognition circuit, and an output connected to said third input of said sub-channel multiplexer;
a data word generator having a first input connected to said output of said data clock pulse recognition circuit, a second input and an output connected to said station output;



a delay circuit connection to said station input;
a sub-channel demultiplexer having a first input connected to said station input via said delay circuit, a second input, a first output connected to said data output, and a second output;
a switch having a first input connected to said second output of said sub-channel demultiplexer, a second input, and an output;
a pulse demodulator having a first input connected to said output of said switch, a second input, and an output connected to said speech receiver;
a data word comparator including an input connected to said station input, a first output connected to said second input of said switch and said second input of said buffer memory, and a second output;
and a bit and word clock pulse generator including a first input connected to said station input, a second input connected to said second output of said data word comparator, a first output connected to said second input of said data word generator, and a second output connected to said second inputs of said pulse modulator and said pulse demodulator.

4,287,592

METHOD AND APPARATUS FOR INTERFACING STATIONS IN A MULTILOOP COMMUNICATIONS SYSTEM

Daniel J. Paulish, Downingtown; Albert J. Meyerhoff, Wynnewood, and George R. Nickett, Warrington, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 23, 1979, Ser. No. 41,870
Int. Cl.[3] **G08B** *5/00*
U.S. Cl. 370—88 **41 Claims**

1. A method of transmitting data from a first station of a communications system to a second station of said communications system, said communications system including a plurality of interconnected communications loops, each of said loops including a ring-connected set of nodes providing data flow unidirectionally from one node to the next, each of said nodes being capable of passing data through itself along its loop, extracting data from its loop or injecting data into its loop, a first subset of each of said loop's set of nodes being local nodes which interface a station to said loop, a second subset of each of said loop's set of nodes being gateway nodes which interface to another of said gateway nodes, each of said stations having associated with it a logical address unique within said communications system, each of said nodes having associated with it a functional address unique within each of said node's respective loop, said method of comprising the steps of:

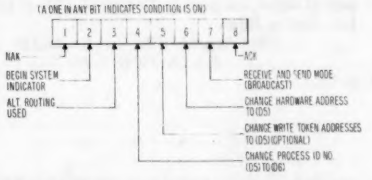
a. translating the logical address of said second station into a second station functional address, said second station functional address specifying the functional address of the local node j to which said second station interfaces if said local node j is on the same loop as the local node i to which said first station interfaces, otherwise said second station functional address specifying the functional address of a gateway node r on the loop node i is on;

a (1). forming a packet of data at the local node i, said packet including an address field and at least one information field, said address field including said second station functional address, said information fields including the logical address of said second station;

b. transmitting to the loop connected to the current packet forming node said formed packet;

c. receiving said formed packet at the node on said loop downline from the current transmitting node;

d. accepting said received packet at said receiving node if


(A ONE IN ANY BIT INDICATES CONDITION IS ON)
1 2 3 4 5 6 7 8
NAK
ACK
BEGIN SYSTEM INDICATOR
RECEIVE AND SEND MODE (BROADCAST)
ALT ROUTING USED
CHANGE HARDWARE ADDRESS TO (DS)
CHANGE WRITE TOKEN ADDRESSES TO (DS) (OPTIONAL)
CHANGE PROCESS ID NO. (DS) TO (D6)

the received packet's second station functional address matches the functional address associated with said receiving node and said receiving node is a local node;

e. if the received packet's second station functional address matches the functional address of the receiving node and the receiving node is one of said loops gateway nodes, transmitting the information fields of said received packet to the gateway node connected to said receiving node and

h. receiving the information fields of said received packet at the gateway node connected to said receiving node,

h (1). translating the received information field corresponding to the logical address of said second station into a corresponding functional address, said corresponding functional address specifying the functional address of the local node j to which said second station interfaces if said local node j is on the same loop as said connected gateway node, otherwise said corresponding functional address specifying the functional address of one of said gateway nodes on the loop connected to said connected gateway node,

i. forming a second packet at the connected gateway node, said second packet including an address field and at least one information field, the address field of said second packet including as its second station functional address the corresponding functional address, the information fields of said second packet including the logical address of said second station, and

j. repeating steps b through f; and

f. repeating steps b through e if the received packet's functional address does not match the functional address of the receiving node.

4,287,593

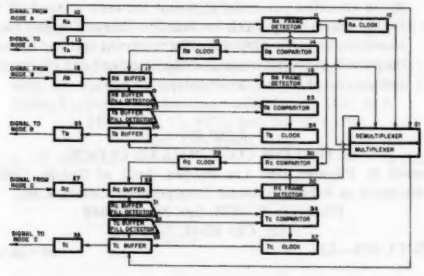
PRESERVATION OF EQUAL TIME DELAYS FOR DIFFERENT PATHS THROUGH DIGITAL COMMUNICATIONS REPEATERS

Harris A. Stover, Vienna, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 808,010, Jun. 20, 1977, Pat. No. 4,142,069. This application Feb. 9, 1979, Ser. No. 10,765

Int. Cl.[3] H04J *3/06*

U.S. Cl. 370—103 5 Claims



1. A time reference distribution system for distributing an accurate time reference to a plurality of nodes of an electronic network wherein each node of said network comprises:

a. a local clock;

b. means for measuring the local clock's time error relative to a system master clock;

c. means for weighting (where such weighting may include a selection function) the paths connecting the nodes over which the time reference is distributed through the network; and

d. means for correcting the time error, of the local clock so that said means for measuring the local clock's time error is not affected by the correction of the clock error at any other node and so that the time reference distribution system does not contain any closed distribution paths; paths connecting each node to one or more neighboring nodes, which distribution system can also be used to synchronize the network and which network contains means for preserving essentially the same signal transit time in both directions of transmission on a duplex transmission path through said means which comprises:

(1) a plurality of receivers, each of which receives an incoming signal from a different node of an electronic network;

(2) a plurality of transmitters, paired with the corresponding receivers, each of which transmits an outgoing signal to a node of the electronic network from which a signal is received;

(3) a demultiplexer/multiplexer, which provides demultiplexing of each received signal and reassignment of each demultiplexed channel to establish new combinations which are multiplexed for transmission, thus permitting duplex communications among all of the nodes which interface with one another through the apparatus;

(4) a first set of variable storage buffers between the receivers and the demultiplexer/multiplexer, which insures through appropriate control means that the incoming signals are in synchronism as they arrive at the demultiplexer/multiplexer;

(5) a second set of variable storage buffers, each buffer interposed between the demultiplexer/multiplexer and a transmitter; and

(6) means for controlling the second set of variable storage buffers in such manner that they add delays to signals transmitted to nodes that are essentially the same as delays that the first set of variable storage buffers put in the signals received from those same nodes.

4,287,594

FUNCTION TEST EVALUATION APPARATUS FOR EVALUATING A FUNCTION TEST OF A LOGICAL CIRCUIT

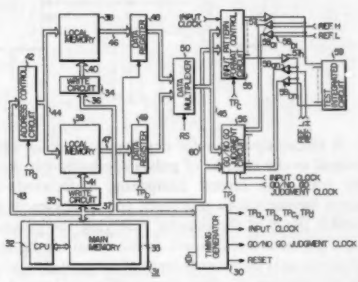
Hisatoshi Shirasaka, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 12, 1979, Ser. No. 102,835

Claims priority, application Japan, Dec. 23, 1978, 53-160709

Int. Cl.[3] G01R *31/28;* G06F *11/00*

U.S. Cl. 371—25 1 Claim



1. A function test evaluation apparatus for evaluating the functioning of an integrated logic circuit comprising:

a control section including a main memory for storing input test information to be supplied to an integrated circuit to be tested and expected value information to be compared with real value information outputted from the integrated circuit after testing, a central processing element for performing various controls;

a plurality of memory means for addressably storing the input test information supplied from said main memory of said control section and the expected value information and for outputting said input test information and said expected value information when addressed;

a plurality of write circuit means for addressably writing the input test information and the expected value information outputted from said main memory into said plurality of memory means;

an address control circuit means for simultaneously supplying the same address information through a plurality of said memory means;

a plurality of data register means for storing said input test information and said expected value information outputted from said memory means when said memory means are addressed by said control circuit and for outputting said stored information in parallel;

parallel-to-serial converting means for receiving said information outputted by said data register means and for converting said received information into serial data;

a pattern format control circuit for receiving and shaping said serial data and supplying said shaped data to said integrated circuit to be tested; and

judgment circuit means for comparing the expected value information outputted serially from said parallel-to-serial converting circuit with the information outputted from said integrated circuit after said integrated circuit has been supplied with said input test information.

4,287,595
ADAPTIVE DELTA-MODULATION NETWORK

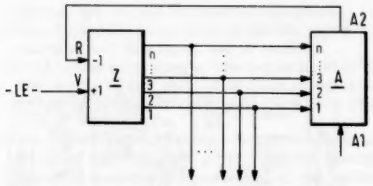
Charles Meyers, Herten, Luxembourg, assignor to Te Ka De Felten & Guilleaume Fernmeldeanlagen GmbH, Nuremberg, Fed. Rep. of Germany

Filed Oct. 29, 1979, Ser. No. 88,867

Claims priority, application Luxembourg, Nov. 11, 1978, 2849001

Int. Cl.³ H03K *7/00*

U.S. Cl. 375—28 **12 Claims**



1. A circuit operative for developing a signal which is proportional to the number of pulses appearing per unit time in a pulse train, the circuit comprising a forwards-backwards counter having a forwards input and a backwards input, said forwards input of the counter receiving the pulses of a first pulse train; means responsive to the count on the counter and applying to said backwards input of the counter a second pulse train, the number of pulses contained in the second pulse train per unit time varying in proportion to the count on the counter; and digital-to-analog converter means receiving the count on the counter and converting the count into a corresponding analog signal whose value indicates the number of pulses appearing per unit time in the first pulse train.

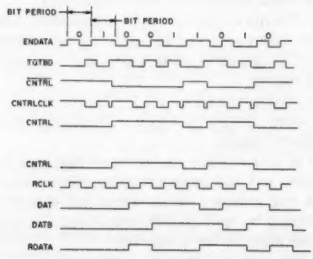
4,287,596
DATA RECOVERY SYSTEM FOR USE WITH A HIGH SPEED SERIAL LINK BETWEEN TWO SUBSYSTEMS IN A DATA PROCESSING SYSTEM

Venu Chari, San Diego, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 26, 1979, Ser. No. 98,019

Int. Cl.³ H04L *27/10*

U.S. Cl. 375—49 **11 Claims**



1. A data processing system, comprising:

at least two subsystems;

a bit serial line for transmitting data between said two subsystems;

a data encoder at each subsystem for encoding the data into a signal having the form of phase encoded pulses, with a first transition at the beginning of each bit period of the phase encoded pulses, a second transition before the next bit period in order to indicate one of two data values, and a lack of the second transition before the next bit period in order to indicate the other of two data values; and

a data recovery circuit at each subsystem for receiving the phase encoded pulses from the bit serial line and decoding the phase encoded pulses to recover the data, said data recovery circuit including means for sampling the phase encoded pulses at a point after the midpoint of each bit period but before the end of that bit period and storing the sampled signal, so that the sampled signal has a transition indicating whether there is a second transition during each bit period of the phase encoded pulses;

said means for sampling including means for delaying the phase encoded pulses by a period between a one-half bit period and a bit period, so that the delayed signal has a transition occurring between the midpoint and end of each bit period of the phase encoded pulses and can be used to sample the phase encoded pulses.

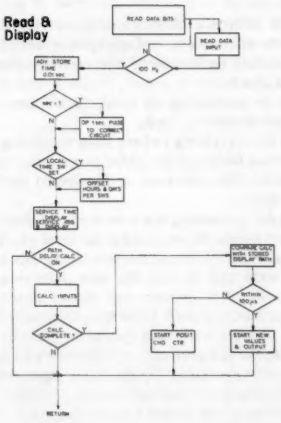
4,287,597
SATELLITE CONTROLLED CLOCK

Donald A. Paynter, and Lee Burpee, both of Goleta, Calif., assignors to Arbiter Systems Incorporated, Goleta, Calif.

Filed Sep. 5, 1978, Ser. No. 939,849

Int. Cl.² H04L *7/00*

U.S. Cl. 455—12 **24 Claims**



1. A receiver from satellite transmitted radio frequency carrier modulated signals in the form of pulse coded information of time values and satellite position having a known pulse rate, comprising:

a variable frequency radio frequency stage;

means for scanning said radio frequency stage over a range including the frequency of said radio frequency carrier;

means for detecting said radio frequency carrier;

means responsive to the detection of said radio frequency carrier to terminate frequency scanning and for tracking said carrier thereafter;

a clock having a nominal frequency related to the pulse rate of said time value signals from said satellite;

means responsive to the termination of scanning of said radio frequency stage for synchronizing said clock with the pulse rate of said time value signals from said satellite;

a delay path calculator;

means responsive to a detection of synchronization of said clock with the pulses of said time signals for enabling said delay path calculator for calculating the transmission path delay time to said satellite;

said delay path calculator including;

means for introducing actual receiver location information into said delay path calculator, means for calculating the

path delay from satellite position received from said satellite and receiver position data;

means responsive to the delay path calculation for shifting said clock time value corrected by said delay path calculation; and

means for displaying path delay corrected decoded local time code signals.

4,287,598

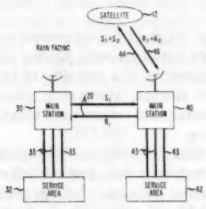
COOPERATING ARRANGEMENT FOR DIVERSITY STATIONS

Rollin E. Langseth, Colts Neck, and Yu S. Yeh, Freehold Township, Monmouth County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 17, 1979, Ser. No. 104,190

Int. Cl.³ H04B *7/02*

U.S. Cl. 455—52 **8 Claims**



5. A transmitting and receiving cooperating diversity station (**30** or **40**) for use in a space diversity arrangement wherein a pair of such stations are spaced-apart and interconnected by a communication link (**20**) and wherein each station is capable of providing two-way communication with a distant point (**12**), the station comprising:

fade detecting means (**100**) capable of detecting a fade condition occurring in transmissions between the station and the distant point and for generating a control signal representative of such fade condition characterized in that

the station further comprises:

means (**74**$_1$–**74**$_n$, **76**, **94**, **95**$_1$–**95**$_n$) capable of handling two-way traffic with an associated service region (**32** or **42**) via an associated distribution network (**33** or **43**); and

diversity switching means (**70**, **102**, **104**, **105**, **108**, **110**, **116**, **118**$_1$–**118**$_{N+1}$, **120**$_1$–**120**$_{N+1}$) capable of (a) being responsive to control signals from the fade detecting means for generating a take-over control signal which is applied to an input to the communication link for transmission to the other station of the pair of spaced-apart interconnected stations and for switching normal two-way communications with the distant point directly to the input to the communication link to permit such two-way communications to be transmitted via the communication link and the other station of the pair of spaced-apart interconnected stations to the distant point, and (b) being responsive to a take-over control signal received from the other station of the pair of spaced-apart interconnected stations at an output from the communication link for providing the capability of two-way communications between the transmitting and receiving cooperating diversity station and the distant point for both normal two-way communications associated with the related service region and two-way communications received on the communication link that would normally be sent by the other station of the pair of spaced-apart interconnected stations to the distant point.

4,287,599

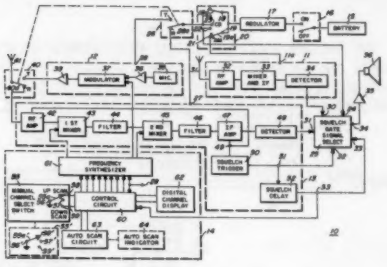
MULTI-CHANNEL COMMUNICATION DEVICE WITH MANUAL AND AUTOMATIC SCANNING ELECTRONIC CHANNEL SELECTION

Nikolai Goncharoff, Hoffman Estates, and Dennis M. Puntil, Melrose Park, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 711,036, Aug. 2, 1976, abandoned. This application Jan. 22, 1979, Ser. No. 5,544

Int. Cl.³ H04B *1/44;* **H03J** *7/32*

U.S. Cl. 455—77 **30 Claims**



6. A multi-channel communication device operable on a plurality of predetermined channels, said communication device comprising:

at least one receiver means manually tunable by a first manual actuator for receiving signals on any selected one of a predetermined plurality of discrete channels, and receiver means producing audible signals related to the signals received on said selected channel;

means coupled to said receiver means for implementing an automatic scan tuning mode which comprises continuously automatically tuning, in discrete steps, said receiver means to each of said discrete channels in a predetermined sequence, said automatic tuning mode being implemented in response to the existence of a scan enable signal, said automatic tuning means including switch means having a second manual actuator with at least a first and second position, said switch means producing and maintaining said scan enable signal in response to an initial manual movement of said second actuator from said first to second position;

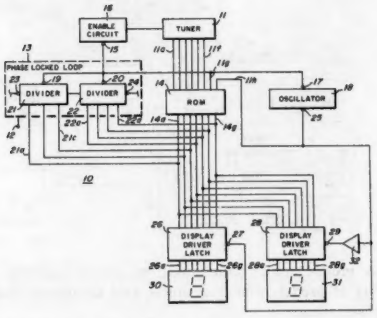
said automatic scan tune mode implementing means including means coupled to said receiver means for automatically producing, as part of said automatic scan tuning mode, a first inhibit signal for temporarily inhibiting, during the existence of said automatic scan tuning mode, further automatic channel tuning during and in response to the reception of a received channel signal by said receiver means of said channel that said receiver means is tuned to and automatically reinstating said automatic scan tuning sequence subsequent to and in response to the termination of the reception of the channel signal; and

transmitter means for selectively transmitting signals on a selected channel corresponding to the selected channel that said receiver means is tuned to, said transmitter means coupled to said receiver means for producing a second inhibit signal for terminating said automatic scan tuning mode in response to actuation of said transmitter means, wherein said automatic scan tuning mode is terminated by said second inhibit signal transmitting said scan enable signal, and subsequent continuous automatic tuning in said automatic scan tuning mode is thereby prevented until said scan enable signal is recreated by again moving said switch means second actuator, whereby the transmission of signals will terminate the automatic scan tuning mode and prevent the automatic resumption of scan tuning thereafter.

4,287,600
FREQUENCY SYNTHESIZER WITH ROM CONTROLLED DIVIDER AND DISPLAY

Robert M. Beckmann, Hanover Park, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 883,109, Mar. 3, 1978, abandoned. This application Mar. 10, 1980, Ser. No. 128,708
Int. Cl.[3] H04B 1/06
U.S. Cl. 455—158 19 Claims



1. Digital control apparatus comprising: memory means for receiving a plurality of digital coded input signals and producing different corresponding pluralities of digital coded output signals in response to each different received plurality of coded input signals;

programmable divider means coupled to said memory means for receiving said plurality of coded output signals and producing, when enabled, different predetermined divisions in response to each different received plurality of coded output signals, wherein said programmable divider means, when disabled, produces the predetermined division corresponding to the coded output signals received by said divider means when said divider means was last enabled;

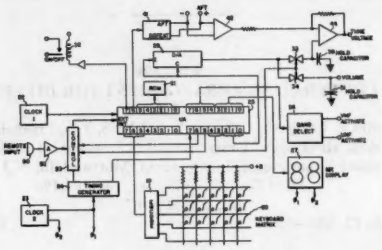
display means coupled to said memory means for receiving said plurality of coded output signals and producing, when enabled, different corresponding predetermined displays in response to each different received plurality of coded output signals, wherein said display means comprises display modules controllable latch means for receiving signals when enabled and storing those received signals when disabled while providing those stored signals as drive signals to said display modules; and

control means coupled to said memory means, said divider means, and said display means for alternately enabling each of said divider and display means while the other means is disabled while also correspondingly alternately changing at least one of said plurality of coded input signals to said memory means, wherein said control means utilizes the memory means to alternately produce different output control signals to sequentially control both said divider means and said display means to produce a display related to the division implemented by said divider means, said control means utilizing said memory means to provide one of said plurality of coded output signals to an enabled one of said divider and display means and then to provide a different related one of said plurality of coded output signals to an enable other one of said divider and display means.

4,287,601
SELF-PROGRAMING MEMORY TUNING SYSTEM

Arthur N. Borg, Fort Wayne; Jerry D. Trostel, Avilla, and Daniel A. Heuer, Fort Wayne, all of Ind., assignors to The Magnavox Company, New York, N.Y.

Filed Oct. 22, 1979, Ser. No. 86,899
Int. Cl.[3] H04B 1/16, 1/26
U.S. Cl. 455—186 9 Claims



1. A broadcast receiver tuning system comprising:

memory means simultaneously storing information identifying the frequencies of a plurality of broadcast stations;

storage means storing information identifying a predetermined frequency and information identifying an incremental frequency;

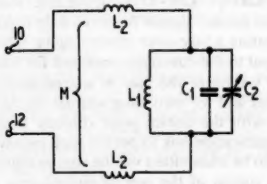
generating means receiving the information identifying said predetermined frequency and the information identifying the incremental frequency and generating from said received information information identifying the approximate frequencies of each of said plurality of broadcast stations; and

conducting means conducting said information identifying said approximate frequencies from said generating means to said memory means.

4,287,602
REJECTION FILTER TO REMOVE TV CHANNEL 6 AND FM RADIO INTERFERENCE

William J. Kessler, Gainesville, Fla., assignor to Corporation for Public Broadcasting, Washington, D.C.

Continuation of Ser. No. 310,110, Nov. 28, 1972, abandoned. This application Oct. 8, 1974, Ser. No. 513,087
Int. Cl.[3] H03H 5/00
U.S. Cl. 455—286 5 Claims



1. A two terminal notch filter network for connection in shunt across two signal input terminals of a signal utilization circuit having a predetermined load impedance and receiving a signal from two output terminals of a signal source having a predetermined source impedance, said network having a low impedance at a desired frequency f_n comprising the series resonant frequency of the network and a rapid change of impedance to a relatively high impedance for frequency bands in the immediate vicinity of f_n with respect to said source and load impedance, whereby said network exhibits a sharp frequency rejection characteristic of a desired, relatively high

attenuation level at the desired frequency f_n, comprising the series resonant frequency of the network, and a desired, relatively low attenuation level for frequency bands adjacent to f_n, comprising:

a parallel LC circuit parallel resonant at a frequency f_p displaced from the resonant frequency f_n of the network and having an equivalent series circuit impedance, the reactance value of which is a function of frequency and is predominately inductive for frequencies below f_p and predominately capacitive for frequencies above f_p, and which is resistive at a frequency equal to f_p,

further reactance means connected in series with said parallel LC circuit between said two terminals of said filter network and having a reactance value selected with respect to the equivalent series reactance value of said parallel LC circuit to establish said series resonant frequency f_n of said filter network, the displacement of said frequency f_p relatively to the frequency f_n being selected to provide optimum sharpness of the said change in impedance of the network while affording adequate attenuation at the desired frequency f_n,

said further reactance means comprising first and second inductors connected in a series circuit of said first inductor, said parallel LC circuit, and said second inductor between said two terminals of said filter network, and

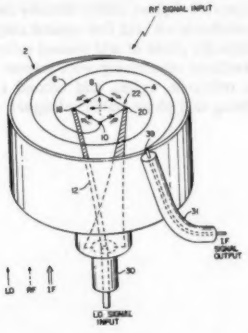
said first and second inductors being mutually coupled.

4,287,603

RADIATED INPUT MIXER

Kenneth R. Moser, South Bend, Ind., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Aug. 23, 1979, Ser. No. 69,197
Int. Cl.³ H04B *1/26*
U.S. Cl. 455—293 **13 Claims**



1. A mixer for converting a radiated radio frequency input signal into an intermediate frequency output signal with the aid of a local oscillator signal, comprising:

an antenna including a pair of arms and a pair of balanced feed terminals each of which is connected to a corresponding arm, with the antenna receiving the radiated radio frequency input signal;

a balun including a pair of conductors and a pair of balanced feed terminals orthogonally disposed with respect to the antenna terminals, and each of the conductors connected to a corresponding balun terminal, with the balun carrying the local oscillator signal;

a balanced diode quad disposed at an end of the balun and connected to the antenna terminals and the balun terminals;

the diode quad providing broad band isolation between the radio frequency and local oscillator signals, and providing a phase relationship between said signals so that the intermediate frequency output signal is present on a selected combination of the antenna arms and the balun conductors;

the balun and the antenna arms being arranged so that the plane of the antenna arms and the plane of the balun are perpendicular, whereby the local oscillator and radio frequency signals vector polarizations are in space quadrature; and

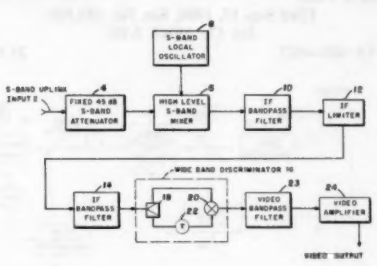
the space quadrature of the signal vector polarizations and the balance of the diodes in the diode quad being determinative of the isolation between the radio frequency and local oscillator signals.

4,287,604

RF AND IF CIRCUITRY OF AN UPLINK RECEIVER

Robert C. Gipe, Cheverly, and William E. Engelkemier, Beltsville, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 18, 1979, Ser. No. 31,265
Int. Cl.³ H04B *1/26*
U.S. Cl. 455—323 **7 Claims**



1. Apparatus for converting an FM mark-and-space RF signal in the S-band to an intermediate frequency mark-and-space signal comprising:

means for attenuating the RF S-Band signal,

a local oscillator producing a signal at a fixed level, and

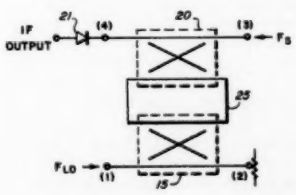
a high-level mixer means, having linear and saturation modes, for mixing the attenuated S-Band signal with the signal produced by the local oscillator and for limiting while the mixer means is in the saturation mode.

4,287,605

DIRECTIONAL FILTER FOR MIXERS, CONVERTERS AND THE LIKE

Michael Dydyk, Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Jul. 16, 1979, Ser. No. 58,236
Int. Cl.³ H04B *1/26*; H01P *1/207, 5/18*
U.S. Cl. 455—330 **9 Claims**



1. A directional filter comprising:

(a) a first transmission line having an input for signals of a first frequency, f_1;

(b) a second transmission line having an input for signals of a second frequency, f_2, and an output; and

(c) coupling means formed of a third transmission line in a closed loop of a length determined by

$$L = \frac{\lambda_{g/1/2}}{1 \pm \frac{\lambda_{g/1}}{\lambda_{g/2}}}$$

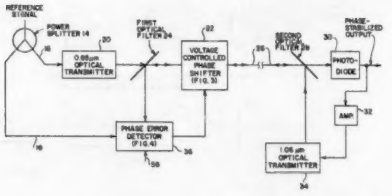
coupled to said first and second transmission lines and tuned to provide substantially maximum coupling of the first frequency signals from the first to the second transmission lines and substantially minimum coupling of the second frequency signals from the second to the first transmission lines.

4,287,606

FIBER OPTIC TRANSMISSION LINE STABILIZATION APPARATUS AND METHOD

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; George F. Lutes, Jr., Glendale, and Kam Y. Lau, Pasadena, both of Calif.

Filed Sep. 17, 1980, Ser. No. 188,160
Int. Cl.³ H04B 9/00
U.S. Cl. 455—617 **21 Claims**



1. A fiber optic transmission line stabilizer for providing a phase-stabilized signal at a receiving end of a fiber optic transmission line with respect to a first reference signal at a transmitting end of said fiber optic transmission line so that said phase-stabilized signal will have a predetermined phase relationship with respect to said first reference signal, said stabilizer comprising:

a first optical transmitter having a first optical output signal at a first optical wavelength, said first optical output signal being modulated by said first reference signal;

a voltage controlled phase shifter responsive to a phase-shift control signal for shifting the phase of said first reference signal modulation on said first optical output signal, the phase-shifted output signal of said voltage controlled phase shifter being provided to said fiber optic transmission line transmitting end;

means for generating a second reference signal at the receiving end of said fiber optic transmission line, said second reference signal being derived from modulation on the phase-shifted output signal of said voltage controlled phase shifter;

a second optical transmitter having a second optical output signal at a second optical wavelength, said second optical output signal being modulated by a signal related to said second reference signal;

means for providing said second optical output signal to said fiber optic transmitting line receiving end;

a phase-error detector for generating said phase-shift control signal, said control signal being related to a phase difference between two input signals;

means for providing a signal related to the modulation on said second optical output signal as received at the transmitting end of said fiber optic transmission line to said phase-error detector;

means for providing said first reference signal to said phase-error detector, said first reference signal and said signal related to the modulation on said second optical output signal comprising said phase-error detector two input signals; and

means for providing said phase-shift control signal to said voltage controlled phase shifter thereby causing the phase of the modulation on said first optical output signal to be altered until the phase of said second reference signal has a predetermined relationship with respect to the phase of said first reference signal, said second reference signal then defining said phase stabilized signal.

DESIGN PATENTS

GRANTED SEP. 1, 1981

ERRATA

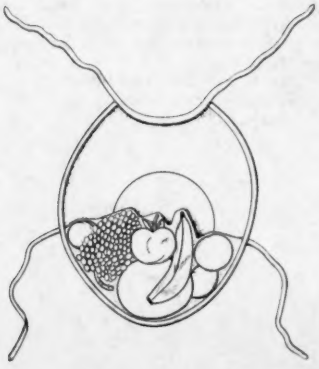
For CLASS	See PATENT NO.
D06–228	260,446

DESIGNS

SEPTEMBER 1, 1981

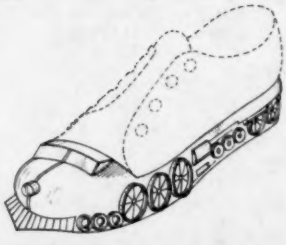
260,445
ATHLETIC SHIRT
Hinda Schreiber, and Eugenie Z. Lindahl, both of Burlington, Vt., assignors to Jogbra Inc., Burlington, Vt.
Filed Dec. 31, 1979, Ser. No. 108,633
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—210

260,446
BIB OR SIMILAR ARTICLE
Deborah A. Bragg, 13918 Castle Blvd., Apt. 304, Silver Spring, Md. 20904
Filed Oct. 30, 1978, Ser. No. 956,004
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—228

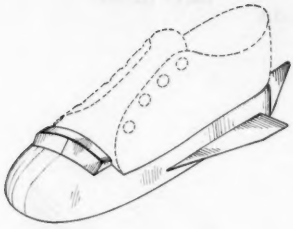


260,447
SOLE AND TOE PORTIONS OF A SHOE
David Greenblatt, Roslyn, and Rick Spinoza, Scarsdale, both of N.Y., assignors to Amfesco Industries, Inc., Plainview, N.Y.
Filed May 4, 1979, Ser. No. 35,855
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—319

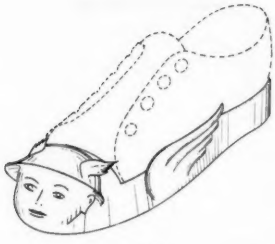
260,448
SOLE AND TOE PORTIONS OF A SHOE
David Greenblatt, Roslyn, and Rick Spinoza, Scarsdale, both of N.Y., assignors to Amfesco Industries, Inc., Plainview, N.Y.
Filed May 4, 1979, Ser. No. 35,856
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—319



260,449
SOLE AND TOE PORTIONS OF A SHOE
David Greenblatt, Roslyn, and Rick Spinoza, Scarsdale, both of N.Y., assignors to Amfesco Industries, Inc., Plainview, N.Y.
Filed May 4, 1979, Ser. No. 35,857
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—319

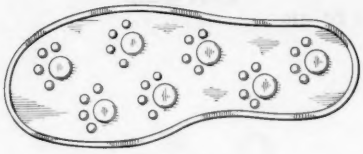


260,450
SOLE AND TOE PORTIONS OF A SHOE
David Greenblatt, Roslyn, and Rick Spinoza, Scarsdale, both of N.Y., assignors to Amfesco Industries, Inc., Plainview, N.Y.
Filed May 4, 1979, Ser. No. 35,858
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—319

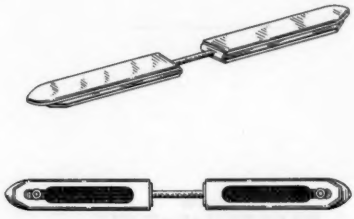


260,451
SOLE OF A SHOE
David Greenblatt, Roslyn, and Rick Spinoza, Scarsdale, both of N.Y., assignors to Amfesco Industries, Inc., Plainview, N.Y.
Filed May 4, 1979, Ser. No. 35,859
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—321

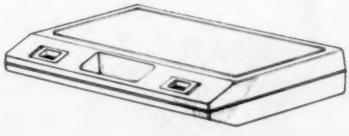
260,452
SOLE OF A SHOE
David Greenblatt, Roslyn, and Rick Spinoza, Scarsdale, both of N.Y., assignors to Amfesco Industries, Inc., Plainview, N.Y.
Filed May 4, 1979, Ser. No. 36,046
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—321



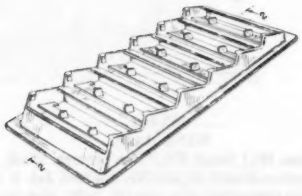
260,453
CLASP FOR BABY DIAPERS
Ronald Carlson, 9833 McNerney Ave., Apt. B, South Gate, Calif. 90280
Filed Aug. 27, 1979, Ser. No. 69,899
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—422



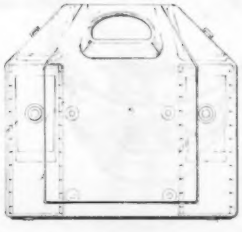
260,454
CASSETTE CARRYING CASE
Pasquale L. Pepicelli, Jr., Chelmsford, Mass.; David Roche, Nashua, N.H.; Gregory Mathus, Concord, and Alan B. Lowry, Canton, both of Mass., assignors to Data Packaging Corporation, Cambridge, Mass.
Filed Jun. 20, 1979, Ser. No. 37,489
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—35



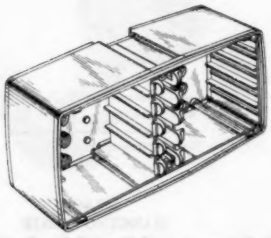
260,455
TAPE CASSETTE HOLDER
Robert F. Haswell, Has-A-Well, Oldfield Rd., Bickley, Bromley, Kent, England
Filed Jul. 24, 1979, Ser. No. 60,208
Claims priority, application United Kingdom, Dec. 21, 1978, 98777/78
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—35



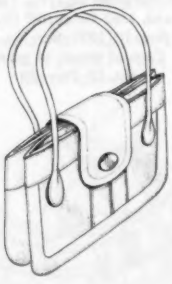
260,456
CARRYING CASE FOR CASSETTES AND CASSETTE PLAYER
Frederick S. Davies, 7801 SE. 75th Pl., Mercer Island, Wash. 98040, and Stephen J. Carrier, 1836 Westlake Ave. N., #302, Seattle, Wash. 98109
Filed Sep. 19, 1979, Ser. No. 76,997
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—35



260,457
STORAGE UNIT FOR TAPE CASSETTES AND CARTRIDGES
Clive S. Rumble, Apt. 2106, 330 Spadina Rd., Toronto, Canada
Filed Nov. 23, 1979, Ser. No. 96,677
Claims priority, application United Kingdom, May 24, 1979, 990,061
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—35



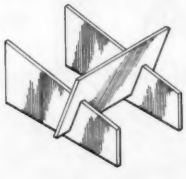
260,458
HANDBAG
Milton I. Siegel, Scottsdale, Ariz., assignor to AMBA Marketing Systems, Inc., Tempe, Ariz.
Filed Sep. 18, 1978, Ser. No. 943,439
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—48



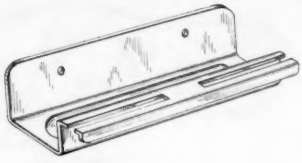
260,459
LOUNGE CHAIR
Thomas Lamb, 9180 Weston Rd., Woodbridge, Ontario, Canada
Filed Oct. 30, 1978, Ser. No. 956,146
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—41

260,460
HANGING CHAIR
Louis D. Osterman, 1003 Rosehill Dr., Boulder, Colo. 80302
Filed May 4, 1979, Ser. No. 36,218
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47

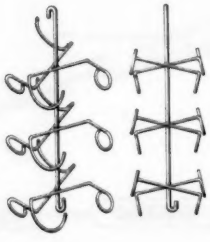
260,461
SUPPORT STAND FOR A LOUDSPEAKER
Steve J. Cohen, 175 Maribeau Sq. NW., Atlanta, Ga. 30327, and Cory W. Hillebrand, 1562 Beechcliff Dr., Atlanta, Ga. 30329
Filed Sep. 10, 1979, Ser. No. 74,108
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—85



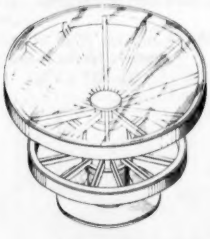
260,462
TOILET ARTICLE CADDY
Stephen Melamed, 2109 N. Kenmore, Chicago, Ill. 60614, and Samuel Sonshine, 4863 E. Carol St., Skokie, Ill. 60077
Filed Sep. 6, 1979, Ser. No. 73,123
Term of patent 14 years
Int. Cl. D23—*02*; D6—*04*
U.S. Cl. D6—86



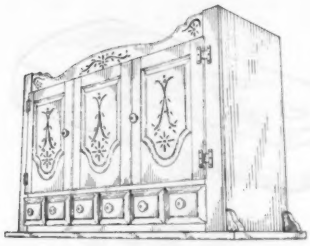
260,463
WINE RACK
Keith N. Imus, 1011 Stitch Rd., Lake Stevens, Wash. 98258
Continuation-in-part of Ser. No. 921,600, Jul. 3, 1978, abandoned. This application Jan. 10, 1979, Ser. No. 2,404
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—113



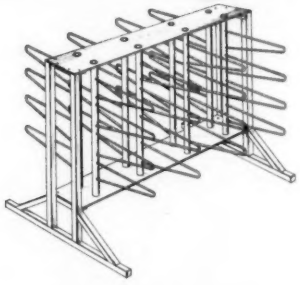
260,464
TABLE
David Alexander, Stoney Creek, Canada, assignor to Jack E. Alexander, Bracebridge, Canada
Filed Jan. 18, 1979, Ser. No. 4,561
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—147



260,465
BUFFET
Melbourne F. Smith, Jr., Hickory, N.C., assignor to Broyhill Furniture Industries, Inc., Lenoir, N.C.
Filed Oct. 12, 1978, Ser. No. 950,706
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—154

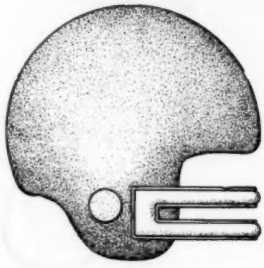


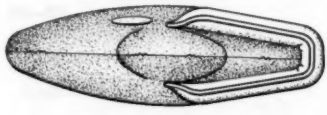
260,466
FABRIC DISPLAY RACK
Donald A. Butcher, Box 394, Rte. 10, Burlington, and Marvin L. Barbee, P.O. Box 4235, Glen Raven, both of N.C. 27215
Filed Dec. 8, 1978, Ser. No. 967,720
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—157



260,467
BALL RACK
David A. Rhine, 21437 Mulholland Dr., Woodland Hills, Calif. 91364
Filed Sep. 24, 1979, Ser. No. 78,374
Term of patent 7 years
Int. Cl. D6—*06*
U.S. Cl. D6—188

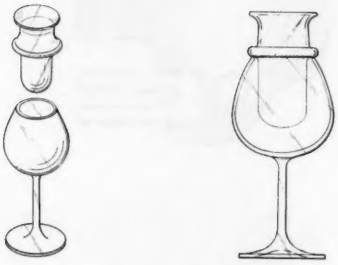
260,468
PILLOW
Donna L. Huebner, 188 Massachusetts Ave., Bayshore, N.Y. 11706
Filed Feb. 27, 1980, Ser. No. 125,148
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—202



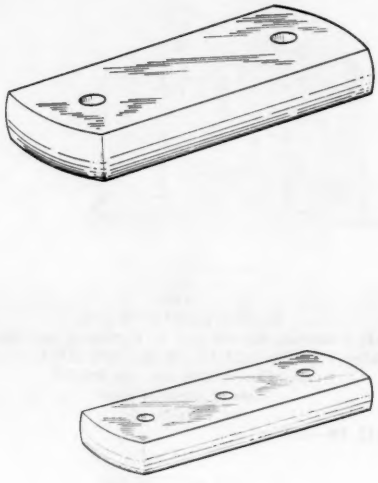


260,469
ROTATABLE FOOD SERVING ASSEMBLY
Joseph W. Blake, South Salem, N.Y., and Anne W. Allen, Albany, Ga., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Jun. 22, 1979, Ser. No. 51,277
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—2

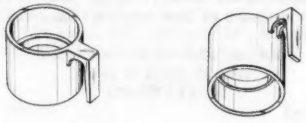
260,470
DESIGN FOR AN ALCOHOLIC BEVERAGE CHILLER
Nicholas P. Angelakos, Staten Island, N.Y., assignor to Lancaster Colony Corporation, New York, N.Y.
Filed Dec. 3, 1979, Ser. No. 99,443
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—3

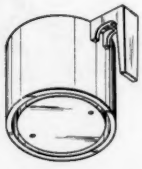


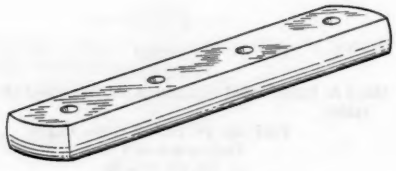
260,472
STAND FOR DRINKING GLASSES
Sidney J. E. Turcotte, Jr., 115 Main St. E., Hamilton, Ontario, Canada (L8N 1G5)
Filed Jul. 30, 1979, Ser. No. 62,182
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—71



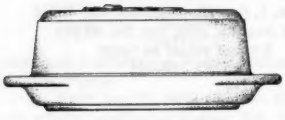
260,471
CUP HOLDER
Jack Douglas, 11645 Montana Ave., Los Angeles, Calif. 90049
Filed Jul. 9, 1979, Ser. No. 55,516
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—70



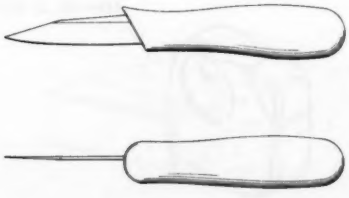




260,473
COVERED BUTTER DISH
Peter Christiani, Anaheim, Calif., assignor to Gourmet-Topf, Inc., Gardena, Calif.
Filed Aug. 17, 1979, Ser. No. 67,290
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—84

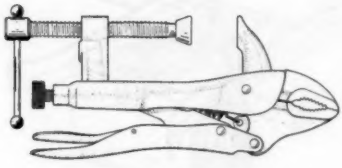


260,474
KITCHEN PARING KNIFE
Donna L. Smith, 1240 Henderson Ave. #4, Sunnyvale, Calif. 94086
Filed Dec. 26, 1979, Ser. No. 106,825
Term of patent 14 years
Int. Cl. D07—*04, 03*
U.S. Cl. D7—147

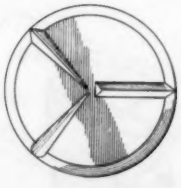


260,475
ADJUSTABLE TRASH BAG HOLDER
Charles D. Hall, 5719 Forest Ave., Des Moines, Iowa 50311
Filed Jun. 1, 1979, Ser. No. 44,707
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—193

260,476
COMBINED LOCKING PLIERS CLAMP
Gregory J. Knaus, Rte. 1, Box 1858, Wetmore, Tex. 78163
Filed Apr. 2, 1979, Ser. No. 26,006
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—55

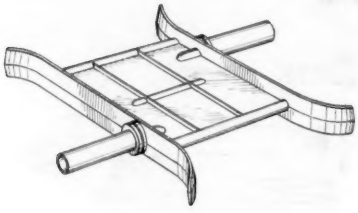


260,477
FISHHOOK HONE
Jack L. Jones, Colorado Springs, Colo., assignor to Kaman Sciences Corporation, Colorado Springs, Colo.
Filed Mar. 22, 1979, Ser. No. 22,810
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—98

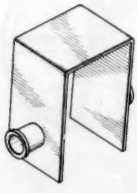


260,478
DOOR HANDLE
Serge Belaiche, Vitry, France, assignor to Serdaneli, France
Filed Aug. 9, 1979, Ser. No. 65,056
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—308

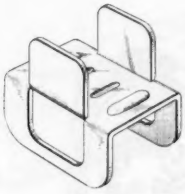
260,479
REEL
Roy E. Carey, 7671 North Ave., Lemon Grove, Calif. 92045
Filed Aug. 3, 1979, Ser. No. 63,590
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D8—359



260,480
WALL OR PARTITION HUNG COAT HOOK
Donald A. DeMars, Canoga Park, Calif., assignor to LeRoy M. Lefkowitz, Van Nuys, Calif.
Filed Nov. 30, 1978, Ser. No. 965,445
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367



260,481
H-CLIP OR SIMILAR ARTICLE
David R. Norcross, Bethesda, and George W. Kingston, Chevy Chase, both of Md., assignors to TECO Products & Testing Corporation, Washington, D.C.
Filed Aug. 6, 1979, Ser. No. 63,915
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—394



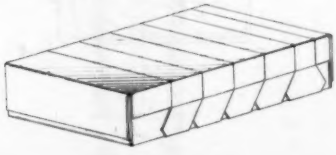
260,482
BOTTLE
Peter T. Agee, Rte. 1, Box 45, Magnolia, Ala. 36754
Filed Aug. 13, 1979, Ser. No. 65,978
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—352

260,483
BOTTLE
Herbert C. Weiland, San Pedro, Calif., assignor to Gould and Associates, Inc., Los Angeles, Calif.
Filed Dec. 26, 1978, Ser. No. 974,139
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—374

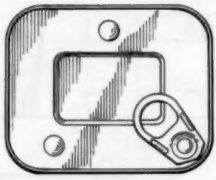
260,484
BOTTLE
Michael K. Goettner, Sylvania, and James E. Plummer, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed Jun. 21, 1979, Ser. No. 50,832
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—378

260,485
BOTTLE
Raymond Ortal, Louveciennes, France, assignor to Societe Stendhal, Paris, France
Filed Aug. 17, 1979, Ser. No. 68,325
Claims priority, application France, Feb. 26, 1979, 79 42207
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—406

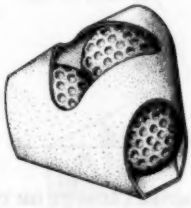
260,486
TEAR STRIP PACKAGING CONTAINER
Robert G. McMullan, Oakville, Canada, assignor to SCM (Canada) Limited, Don Mills, Canada
Filed Feb. 8, 1979, Ser. No. 10,327
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—416



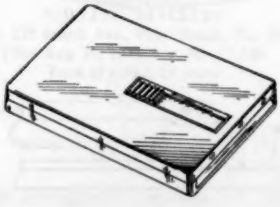
260,487
CAN OR THE LIKE
Alan A. Grubman, and Gary K. Hasegawa, both of Chicago, Ill., assignors to The Continental Group, Inc., Stamford, Conn.
Filed Aug. 24, 1979, Ser. No. 69,669
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—416



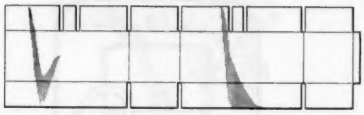
260,488
GOLF BALL PACKAGE
Robert P. Kinneary, 3014 Alpine Ter., Cincinnati, Ohio 45208
Filed Jul. 5, 1979, Ser. No. 54,950
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—418



260,489
SOAP DISPENSER
William F. Pritchard, 220 Metcalf, Maxwell, Iowa 50161
Filed Feb. 5, 1979, Ser. No. 9,112
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—432

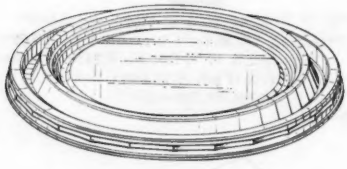


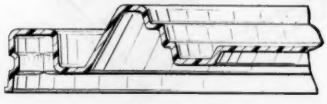
260,490
CARTON BLANK
Brian G. Baker, 32, Shaftsbury Cir., South Harrow, Middlesex, England
Filed Nov. 17, 1978, Ser. No. 961,601
Claims priority, application United Kingdom, Jun. 2, 1978, 984897
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—433



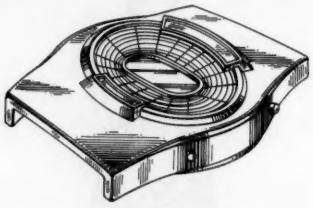
260,491
CARTON
Gregory P. Maclin, Stone Mountain, Ga., assignor to Container Corporation of America, Chicago, Ill.
Filed Sep. 6, 1979, Ser. No. 73,125
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—433

260,492
CONTAINER CLOSURE OR THE LIKE
Kenneth E. Scott, Phoenix, Ariz., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Jun. 18, 1979, Ser. No. 49,263
Term of patent 14 years
Int. Cl. D09—*07*
U.S. Cl. D9—452



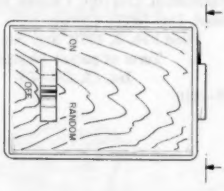


260,493
WATCH CASE
Cabanne H. Link, 725 Pleasant Valley La., Richardson, Tex. 75080
Filed Jun. 18, 1979, Ser. No. 49,945
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38

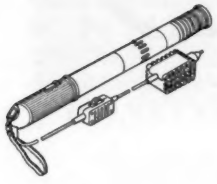


260,494
WRISTWATCH
Jean Dinh Van, 15, Place Gaillon, 75002 Paris, France
Filed Mar. 19, 1979, Ser. No. 21,681
Claims priority, application Switzerland, Sep. 19, 1978, 67543/78
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

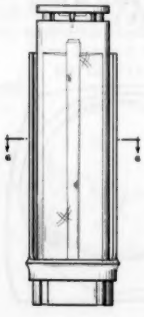
260,495
TIMER
Lee L. Von Gunten, P.O. Box 28, Prospect Heights, Ill. 60070
Filed Feb. 5, 1979, Ser. No. 9,344
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—40



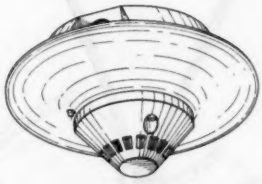
260,496
PORTABLE RADAR-TYPE SPEED METER
Viktor A. Petrovsky, ulitsa Pugacheva, 19a, kv. 45; Lev G. Gassanov, ulitsa Uritskogo, 25, kv. 65, both of Kiev; Sergei M. Belyaev, ulitsa Magnitogorskaya, 3, kv. 97; Lev A. Kochetov, ulitsa Khersonskaya, 3, kv. 30, both of Moscow; Vitaly L. Kryzhanovsky, ulitsa Transheinaya, 11, kv. 1, Kiev; Andrei A. Palamarchuk, ulitsa Saratovskaya, 49, kv. 18, Kiev; Viktor D. Ushakov, ulitsa D.Bednogo, 25, kv. 52, Kiev; Rafail J. Timraleev, ulitsa Levanevskogo, 4, kv. 43-2, Kiev; Vitaly M. Parfenjuk, ulitsa Geroev Sevastopolya, 33, kv. 55, Kiev; Alexandr S. Pilipenko, ulitsa Kablukova, 3, kv. 29, Kiev; Petr A. Goncharov, ulitsa Artema, 10, kv. 1, Kiev, and Anatoly I. Ponomarenko, poselok Bucha, ulitsa Kochubeya, 8, Kievskaya oblast, all of U.S.S.R.
Filed Mar. 23, 1979, Ser. No. 23,260
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46



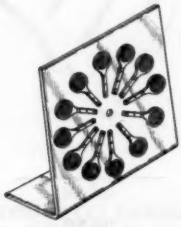
260,497
WIND CHILL INDICATOR
Charlie J. Howard, Asheville, and Edward L. Peart, Arden, both of N.C., assignors to Sybron Corporation, Rochester, N.Y.
Filed Aug. 20, 1979, Ser. No. 68,186
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57



260,498
SMOKE DETECTOR HOUSING
John M. Macmillan, Deep River, and Hilario S. Costa, Old Saybrook, both of Conn., assignors to Conrac Corporation, Stamford, Conn.
Filed Feb. 9, 1979, Ser. No. 10,984
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



260,499
COMBINED CLOCK FACE AND SUPPORT
Gloria Cheshaek, 11595 S. Stelling Rd., Cupertino, Calif. 95014
Filed Apr. 3, 1978, Ser. No. 893,173
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—125

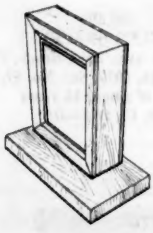


260,500
JEWELED BRACELET
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Aug. 16, 1979, Ser. No. 67,129
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—6

260,501
BRACELET OR SIMILAR ARTICLE
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Sep. 12, 1979, Ser. No. 74,795
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—6

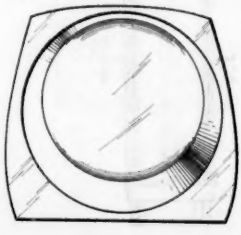
260,502
TALISMAN
Houshang Vafi, Rte. 1, Box 669, Glencoe, Mo. 63028
Filed Apr. 6, 1979, Ser. No. 27,741
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—75

260,503
ILLUMINATED DISPLAY
Nickolas G. Stangarone, 1644 McGovern, Highland Park, Ill. 60035
Filed Aug. 23, 1978, Ser. No. 935,934
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—132

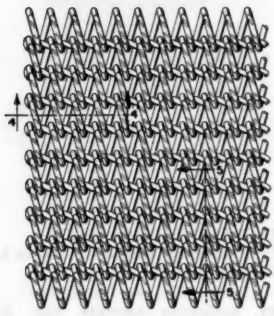


260,504
STANDING PLAQUE
Leo F. Wildgen, Minneapolis, Minn., assignor to Princeton Industries Corporation, Princeton, Ind.
Filed Apr. 30, 1979, Ser. No. 34,482
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—140

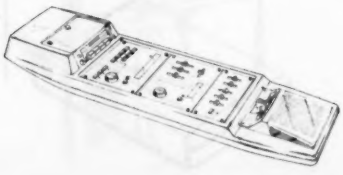
260,505
STANDING PLAQUE
Leo F. Wildgen, Minneapolis, Minn., assignor to Princeton Industries Corporation, Princeton, Ind.
Filed Apr. 30, 1979, Ser. No. 34,483
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—140



260,506
CONVEYOR BELT
Gerald C. Roinestad, Winchester, Va., assignor to Ashworth Bros., Inc., Fall River, Mass.
Filed Sep. 28, 1978, Ser. No. 946,846
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—60

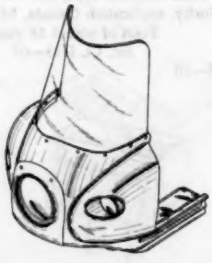


260,507
AUTOMOBILE OVERHEAD COMBINED RADIO AND CASSETTE PLAYER CONSOLE OR SIMILAR ARTICLE
Kanji Kosugi, Hirakata, and Benito Mishiro, Sakai, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Nov. 30, 1979, Ser. No. 99,129
Claims priority, application Japan, May 31, 1979, 54-22466
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155

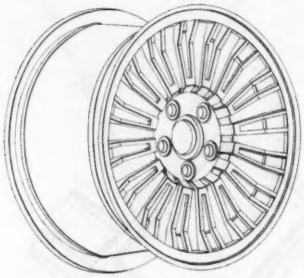


260,508
TOW VEHICLE BRAKE PEDAL ATTACHMENT FOR AN ELECTRIC TRAILER BRAKE SYSTEM
Paul Weiner, Pinckney, Mich., assignor to Kelsey Hayes Co., Romulus, Mich.
Filed Aug. 17, 1978, Ser. No. 934,558
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—174

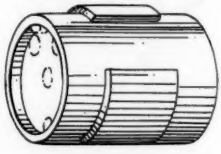
260,509
MOTORCYCLE FAIRING
Matthew P. Guzzetta, 10425 Loma Rancho Dr., Spring Valley, Calif. 92077
Filed Sep. 24, 1979, Ser. No. 78,164
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—182



260,510
AUTOMOBILE WHEEL
James R. Powers, Los Angeles, Calif., assignor to DeLorean Motor Company, Bloomfield Hills, Mich.
Filed May 10, 1978, Ser. No. 904,722
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211

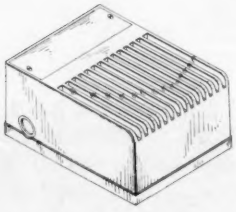


260,511
ELECTRICAL CONNECTOR HOUSING
Radosav Avramovich, Libertyville, Ill., assignor to Daniel Woodhead, Inc., Northbrook, Ill.
Filed Aug. 3, 1978, Ser. No. 930,728
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24

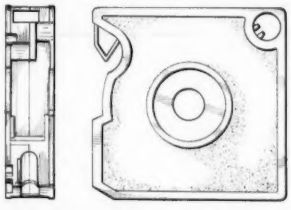


260,512
ELECTRIC PLUG
Marijan Djurinec, Acton, Canada, assignor to Smith & Stone Limited, Toronto, Canada
Filed Aug. 28, 1978, Ser. No. 937,193
Claims priority, application Canada, Mar. 3, 1978, 0303781
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—28

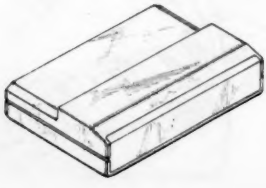
260,513
HOUSING FOR ELECTRICAL CIRCUITS
Kenneth C. Comstock, 161 W. Washington, Murray, Utah 84070
Filed Mar. 15, 1979, Ser. No. 20,815
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—40



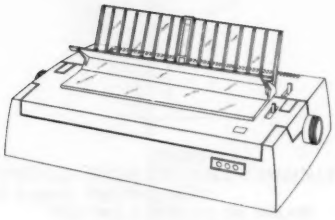
260,514
MAGNETIC TAPE CASSETTE
Peter Gell, Redfern, Australia, assignor to Tuscan Industries Pty. Limited, Redfern, Australia
Filed May 15, 1978, Ser. No. 905,844
Claims priority, application Australia, Mar. 22, 1978, 74310/78
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—11



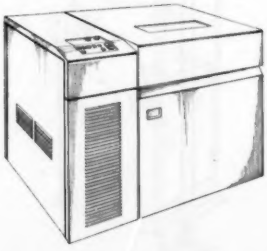
260,515
CASE FOR INTERCHANGEABLE PROGRAM MODULE FOR A PERSONAL COMPUTER OR THE LIKE
Robert A. Welch, and Arthur W. Chin, both of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Nov. 13, 1978, Ser. No. 960,493
Term of patent 14 years
Int. Cl. D14—*00*
U.S. Cl. D14—11



260,516
TERMINAL PRINTER COVER
Vincent Giannotti, Jr., Austin, Tex.; Henry Kapper, Raleigh, N.C., and Edward J. Sabella, Georgetown, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 22, 1978, Ser. No. 973,055
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—111



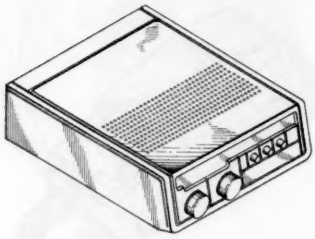
260,517
PRINTER
Tommy R. Hardy, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jul. 16, 1979, Ser. No. 57,627
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—111



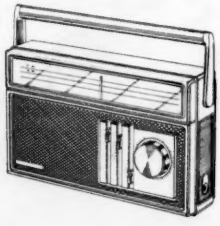
260,518
VEHICULAR TWO-WAY RADIO CONTROL UNIT OR SIMILAR ARTICLE
Kenneth W. Larson, Elmhurst, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 29, 1979, Ser. No. 53,608
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

260,519
TELEPHONE KEY BASE
Hans G. Thames, Bandhagen, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Nov. 22, 1978, Ser. No. 962,874
Claims priority, application Sweden, May 31, 1978, 78001424
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60

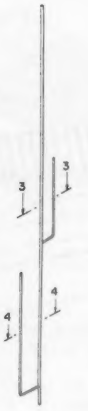
260,520
VEHICULAR TWO-WAY RADIO OR SIMILAR ARTICLE
Albert L. Nagele, Wilmette, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 16, 1979, Ser. No. 21,031
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



260,521
RADIO RECEIVER
Teruyuki Nishimoto, Hirakata; Kunio Hoshino, Katano; Kikuo Ohta, Ikoma; Benito Mishiro, Sakai; Katsutoshi Kido, Kyoto, and Kanji Kosugi, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Nov. 27, 1979, Ser. No. 97,939
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70

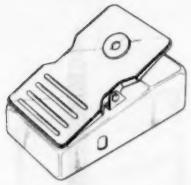


260,522
MULTI-J ANTENNA
Harold Guretzky, 56-05 Clearview Expwy., Bayside, N.Y. 11364
Filed Oct. 2, 1978, Ser. No. 947,427
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—86

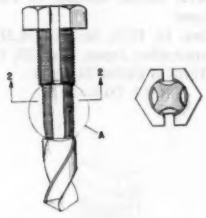


260,523
TROLLING MOTOR CONTROL
Harold C. Rains, III, 22 Ferndale, and Jerry Blankenship, Rte. 3, Box 286A, both of Ft. Smith, Ark. 72901
Filed Feb. 22, 1979, Ser. No. 14,052
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—4

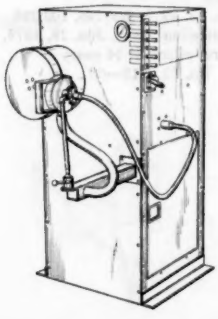
260,524
FOOT OPERATED CONTROLLER FOR SEWING MACHINE
Yoshitoshi Satoh, Sukagawa, Japan, assignor to Yamamoto Electric Industrial Co., Ltd., Japan
Filed Feb. 28, 1979, Ser. No. 16,349
Term of patent 14 years
Int. Cl. D15—*99*; D13—*99*
U.S. Cl. D15—72



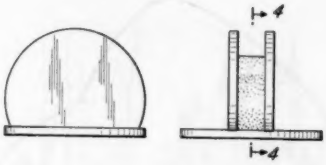
260,525
CHANNEL DRILL AND BOLT COMBINATION
Will M. Lassiter, High Point, N.C.
Filed Dec. 4, 1978, Ser. No. 966,479
Term of patent 14 years
Int. Cl. D15—*09*; D8—*08*
U.S. Cl. D15—139



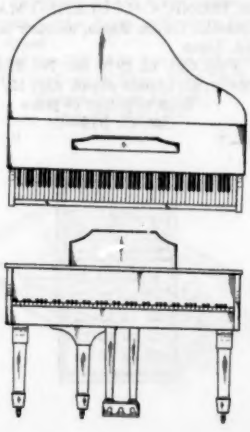
260,526
TIRE REFINISHING MACHINE
James C. Satterfield, Dallas, Tex., assignor to Tire Cosmotology, Inc., Dallas, Tex.
Filed Apr. 16, 1979, Ser. No. 30,027
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D15—199



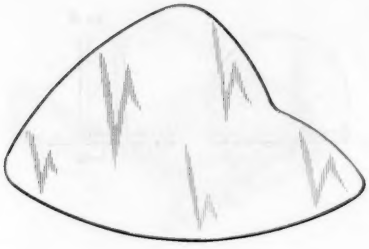
260,527
SPECTACLE HOLDER
Stefan Engelmann, 61-38 164th St., Flushing, N.Y. 11365
Filed Mar. 2, 1979, Ser. No. 16,952
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—82



260,528
ELECTRONIC BABY GRAND PIANO
Wil Decker, 212 Woodlawn Ave., St. James, N.Y. 11780
Filed Jun. 12, 1979, Ser. No. 47,815
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D17—8



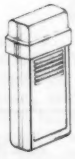
260,529
GUITAR PICK
John Pearse, R.D. 1, Bethlehem, Pa. 18017
Filed Aug. 10, 1979, Ser. No. 65,593
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—20



260,530
ELECTRONIC CALCULATING MACHINE
Tsutomu Yamasaki, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Oct. 11, 1979, Ser. No. 83,845
Claims priority, application Japan, Apr. 12, 1979, 54-15206
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7

260,531
WRITING INSTRUMENT
Giorgio Della Beffa, Strada Givoletto 1, San Gillio, Italy
Filed Mar. 15, 1979, Ser. No. 20,699
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—47

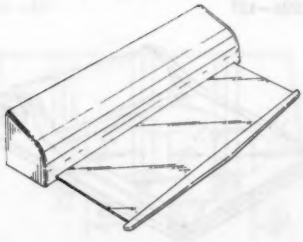
260,532
CASING FOR AN ERASER OR THE LIKE
Gouji Sakaoka, Tokyo, Japan, assignor to Pentel Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 11, 1979, Ser. No. 74,312
Claims priority, application Japan, Mar. 29, 1979, 54-12789
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—53



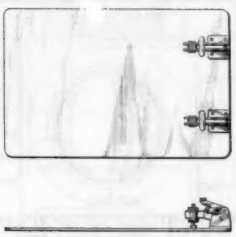
260,533
PENPOINT OR SIMILAR ARTICLE
Daisaburo Azuma, Soka, Japan, assignor to Pentel Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 13, 1979, Ser. No. 103,295
Claims priority, application Japan, Jun. 29, 1979, 54-27186
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—55

260,534
TELEPHONE REGISTER
Hans Halm, Herne, Fed. Rep. of Germany, assignor to Arlac-Werk Heiko Ippen, Hamburg, Fed. Rep. of Germany
Filed May 2, 1979, Ser. No. 35,232
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76

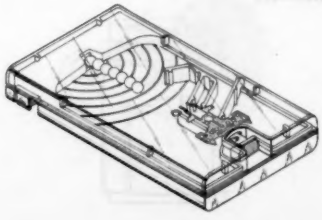
260,535
INDEX
Thomas Bovet, Hong Kong, Hong Kong, assignor to Uptrend Products Limited, Hong Kong, Hong Kong
Filed Aug. 1, 1979, Ser. No. 62,654
Claims priority, application United Kingdom, Feb. 26, 1979, 988730/79
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76



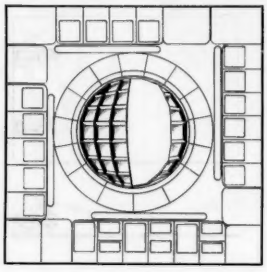
260,536
CLIPBOARD
Samir N. Santy, 250 High Plains Dr., Orange, Conn. 06477
Filed Sep. 18, 1978, Ser. No. 944,329
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—88



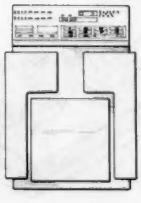
260,537
POCKET GAME HOUSING
Masaki Mayuzumi, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Sep. 13, 1979, Ser. No. 75,129
Claims priority, application Japan, Mar. 19, 1979, 54-10845
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—10



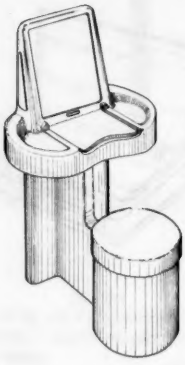
260,538
GAME BOARD
James G. Alex, Park Ridge, Ill., assignor to J.G.A. Enterprises, Inc., Chicago, Ill.
Filed Jun. 22, 1979, Ser. No. 51,044
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—35



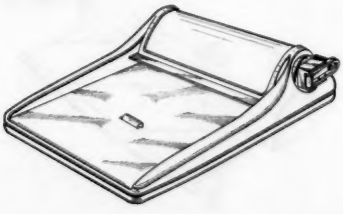
260,539
TOY CONSOLE
Richard M. Rubin, Hollywood, Calif., assignor to Paramount Pictures Corporation, Los Angeles, Calif.
Filed Apr. 10, 1979, Ser. No. 28,838
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—111



260,540
TOY DRESSING TABLE OR SIMILAR ARTICLE
John R. Nottingham, 2997 Washington Blvd., Cleveland Heights, Ohio 44118, and John W. Spirk, Jr., 2533 Euclid Heights Blvd., Cleveland Heights, Ohio 44106
Filed Nov. 20, 1978, Ser. No. 962,297
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—121



260,541
TOY PRINTER
Ng C. Sun, 138 Wing Lok St., 10th Floor, Hong Kong, Hong Kong
Filed Dec. 12, 1979, Ser. No. 102,640
Claims priority, application United Kingdom, Jun. 28, 1979, 990502/79
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—127



260,542

MULTI STATION PHYSICAL EXERCISER

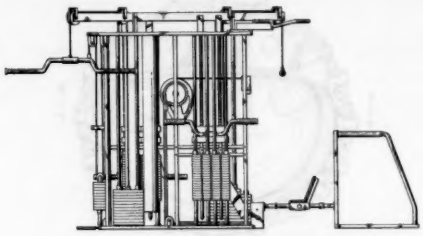
Lloyd J. Lambert, Jr., 1538 College Ave., South Houston, Tex. 77587

Filed Oct. 4, 1978, Ser. No. 948,636

Term of patent 14 years

Int. Cl. D21—*02*

U.S. Cl. D21—195



260,543

PLAYGROUND SLIDE

Donald S. Ament, Encino, and Duane S. Ament, Hollywood, both of Calif., assignors to Miracle Recreation Equipment Company, Grinnell, Iowa

Filed Sep. 20, 1979, Ser. No. 77,365

Term of patent 14 years

Int. Cl. D21—*03*

U.S. Cl. D21—244

260,544

PLAYGROUND SWING

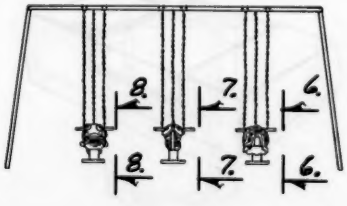
Donald S. Ament, Encino, and Duane S. Ament, Hollywood, both of Calif., assignors to Miracle Recreation Equipment Company, Grinnell, Iowa

Filed Sep. 20, 1979, Ser. No. 77,359

Term of patent 14 years

Int. Cl. D21—*03*

U.S. Cl. D21—246



260,545

RIDER SEAT FOR PLAYGROUND APPARATUS

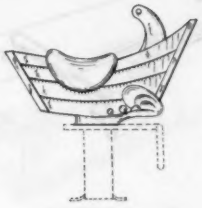
Donald S. Ament, Encino, and Duane S. Ament, Hollywood, both of Calif., assignors to Miracle Recreation Equipment Company, Grinnell, Iowa

Filed Sep. 20, 1979, Ser. No. 77,357

Term of patent 14 years

Int. Cl. D21—*03*

U.S. Cl. D21—247



260,546

RIDER SEAT FOR PLAYGROUND APPARATUS

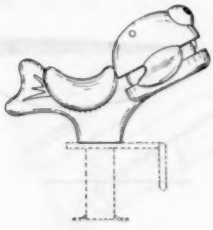
Donald S. Ament, Encino, and Duane S. Ament, Hollywood, both of Calif., assignors to Miracle Recreation Equipment Company, Grinnell, Iowa

Filed Sep. 20, 1979, Ser. No. 77,358

Term of patent 14 years

Int. Cl. D21—*03*

U.S. Cl. D21—247



260,547

RIDER SEAT FOR PLAYGROUND APPARATUS

Donald S. Ament, Encino, and Duane S. Ament, Hollywood, both of Calif., assignors to Miracle Recreation Equipment Company, Grinnell, Iowa

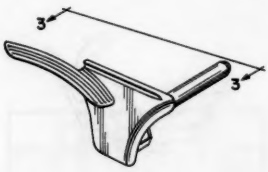
Filed Sep. 20, 1979, Ser. No. 77,360

Term of patent 14 years

Int. Cl. D21—*03*

U.S. Cl. D21—247

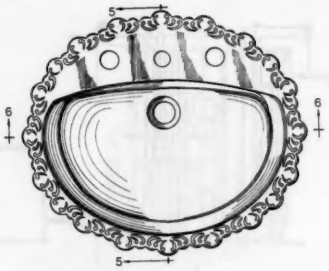
260,548
SAFETY LOCK FOR HAND GUN
Darrell E. Holland, 455 "A" Ave., Coronado, Calif. 92118
Filed Nov. 26, 1979, Ser. No. 97,726
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—7



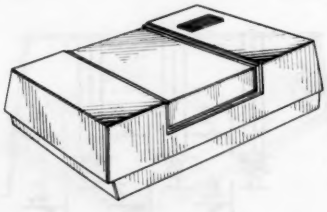
260,549
FISHING LURE
Paul W. Lee, 2424 Quimby Rd., San Jose, Calif. 95148
Filed Mar. 21, 1980, Ser. No. 131,949
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

260,550
WASH STAND
Jack L. Hetzler, Corona Del Mar, and John L. Carpenter, Mission Viejo, both of Calif., assignors to Bristol Corporation, Newport Beach, Calif.
Filed Jun. 18, 1979, Ser. No. 49,576
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—54

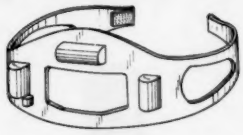
260,551
LAVATORY OR THE LIKE
Myra Tang, Bound Brook, N.J., assignor to American Standard Inc., New York, N.Y.
Filed Aug. 6, 1979, Ser. No. 64,341
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58



260,552
CONTACT LENS STERILIZER UNIT
Michael D. Thomas, Arab, Ala., and Francis E. Ryder, Barrington, Ill., assignors to Ryder International Corporation, Arab, Ala.
Filed Aug. 9, 1978, Ser. No. 932,689
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—9



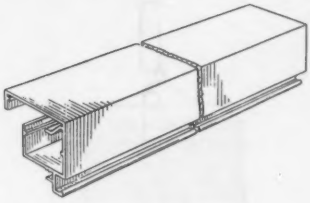
260,553
VIBRATING MASSAGING MASK
An C. Wu, No. 118-3, Hsin-Yi Rd., Section 3, Taipei, Taiwan
Filed Feb. 3, 1978, Ser. No. 874,839
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—40



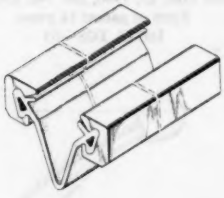
260,554
MICROPIPETTING DEVICE
William J. Roach, 12933 Lakeshore No., Auburn, Calif. 95603
Filed Apr. 9, 1979, Ser. No. 28,086
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—55

260,555
DECORATIVE WINDOW PANEL FOR DOORS
Lawrence R. Martinelli, Chicago, Ill., assignor to United States Gypsum Company, Chicago, Ill.
Filed Jun. 12, 1978, Ser. No. 914,261
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—72

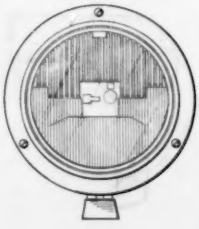
260,556
EXTRUDED FRAME ELEMENT
Werner Kloke, Whitby, Canada, assignor to Prem Gandy, Downsview, Canada
Filed Jun. 20, 1979, Ser. No. 50,363
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



260,557
EXPANSION JOINT SEALING STRIP ASSEMBLY FOR ROADWAYS
William E. Bowman, Englewood, Colo., assignor to Bowman Construction Supply, Inc., Denver, Colo.
Filed Nov. 30, 1979, Ser. No. 98,809
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



260,558
HEADLIGHT
Pierre Catte, Sevres, France, assignor to Cibie Projecteurs, Bobigny, France
Filed Jul. 12, 1979, Ser. No. 57,144
Claims priority, application France, Jun. 1, 1979, 79 42152
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—29



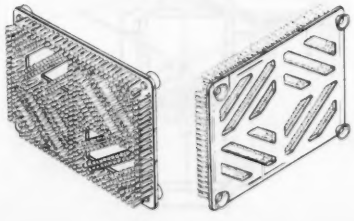
260,559
COMBINED COSMETIC PENCIL AND BRUSH
John J. Scalice, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Aug. 27, 1979, Ser. No. 69,718
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—7

260,560
EYE MAKEUP APPLICATOR
Milton O. Flower, Van Nuys, Calif., assignor to Max Factor & Co., Hollywood, Calif.
Filed Mar. 27, 1980, Ser. No. 134,919
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—7

260,561
HAIR DRYER
Matthew L. Andis, Racine, Wis., assignor to Andis Clipper Company, Racine, Wis.
Filed Nov. 23, 1979, Ser. No. 96,785
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13

260,562
HAIR TRIMMER
William Mack, Comack, N.Y., and Meyrick K. Rogers, Lancaster, Pa., assignors to Clairol Incorporated, New York, N.Y.
Filed Jul. 20, 1979, Ser. No. 58,965
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—53

260,563
WALL BRUSH
Stephen W. Walsh, Jr., 26 Kienia Rd. R.R. 3, Hudson, N.H. 03051
Continuation-in-part of Ser. No. 910,641, May 30, 1978, abandoned. This application Dec. 10, 1979, Ser. No. 101,622
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D28—63

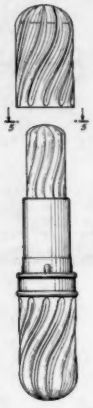


260,564

COMBINED COSMETIC STICK AND A CASE THEREFOR

John E. Jedzinak, Suffern, N.Y.; Eustace Fotiu, Mahwah, N.J., and Fred Markrow, Bronx, N.Y., assignors to Revlon, Inc., New York, N.Y.

Filed Sep. 17, 1979, Ser. No. 76,419
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—89

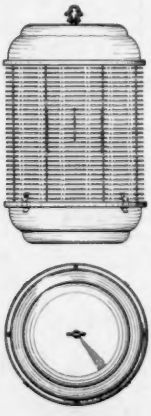


260,565

COMBINED BIRD CAGE ROOF AND BOTTOM TRAY

Michael Biro, and Hans Muckenfuss, both of Montreal, Canada, assignors to Rolf C. Hagen Ltd., Montreal, Canada

Filed Oct. 16, 1979, Ser. No. 85,196
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—4

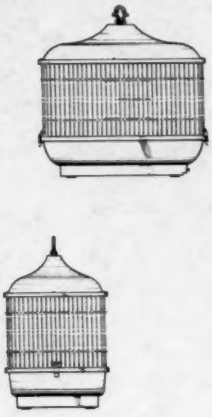


260,566

COMBINED BIRD CAGE ROOF AND BOTTOM TRAY

Michael Biro, and Hans Muckenfuss, both of Montreal, Canada, assignors to Rolf C. Hagen Ltd., Montreal, Canada

Filed Oct. 16, 1979, Ser. No. 85,245
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—4

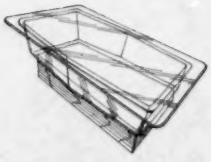


260,567

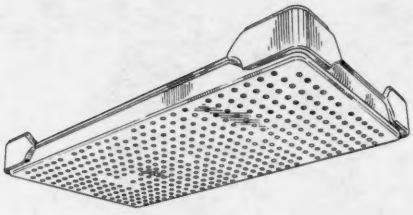
COMBINED TABLE AND AQUARIUM OR THE LIKE

Lubomir Holec, 5220 Outer Dr., Windsor, Ontario, Canada (N9A 6J3)

Filed Mar. 13, 1980, Ser. No. 130,012
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—11



260,568
STACKABLE TRAY
Richard S. Cherry, Don Mills, Canada, assignor to Phillips-Parkway Corporation, Toronto, Canada
Filed Feb. 26, 1979, Ser. No. 15,320
Claims priority, application Canada, Oct. 13, 1978, 1310786
Term of patent 14 years
Int. Cl. D03—*99*; D09—*04*
U.S. Cl. D99—44



260,569
DRUM
Seymour Zilbert, Demarest, N.J., assignor to Bergen Barrel & Drum Co., Demarest, N.J.
Filed Apr. 4, 1978, Ser. No. 893,514
Term of patent 14 years
Int. Cl. D99—*99*
U.S. Cl. D99—51

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TO WHOM

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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. J. Antunes & Co.: *See—*
Miller, Dye O.; Antunes, August J.; and Antunes, Jerome, 4,286,509, Cl. 99-332.000.

A. O. Smith Corporation: *See—*
Nickel, Herbert W., 4,286,573, Cl. 126-362.000.

AB Siwertell: *See—*
Tingskog, Karl A. L., 4,286,909, Cl. 414-144.000.

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Dren, Anthony T.; and Bopp, Barbara A., 4,287,192, Cl. 424-248.510.
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Abe, Hiroshi: *See—*
Tomita, Chuji; Abe, Hiroshi; and Shimazu, Katashi, 4,287,424, Cl. 250-445.00T.

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Abraham, Fayez; and Bowman, Edward, to Tyler Refrigeration Corporation. Energy saving refrigeration system. 4,286,437, Cl. 62-151.000.

Abston, J. B.: *See—*
McMahon, Edward H., Jr.; and Abston, J. B., 4,287,244, Cl. 428-35.000.

Accuratio Systems, Inc.: *See—*
James, James R.; and Neathery, Michael F., 4,286,732, Cl. 222-46.000.

ACF Industries, Inc.: *See—*
Jantzen, Steve L., 4,286,524, Cl. 105-248.000.
Kacal, Gary W.; and Partridge, Charles C., 4,286,614, Cl. 137-72.000.
Saffley, Edgar F., 4,286,446, Cl. 72-5.000.

Ackerman, Donald W., to Garden Way Incorporated. Combination tiller and cultivator and drive control therefor. 4,286,670, Cl. 172-42.000.

Acoustic Standards Corporation: *See—*
Ophir, Jonathan; Maklad, Nabil F.; and Jaeger, Paul M., 4,286,455, Cl. 73-1.0DV.

Adams, William F.: *See—*
Novak, Milan; and Adams, William F., 4,286,404, Cl. 43-87.000.

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Adickes, Cecil F., Jr.; and Berko, David R., to Mego Corp. Doll for containing filament producing fluid. 4,286,407, Cl. 46-163.000.

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Atkinson, John H., Jr., 4,286,581, Cl. 126-439.000.

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Ichimura, Kunihiro, 4,287,335, Cl. 542-455.000.

Agfa-Gevaert AG: *See—*
Himmelmann, Wolfgang; Bruck, Rolf; Sauerteig, Wolfgang; Kruck, Peter; Kolb, Gunter; and Sackmann, Gunter, 4,287,299, Cl. 430-537.000.

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Meyer, Rudolf, 4,287,522, Cl. 346-75.000.

Agfa-Gevaert, N.V.: *See—*
Vanassche, Willy J.; Pattyn, Herman A.; Moisar, Erik; and Klotzer, Sieghart, 4,287,296, Cl. 430-411.000.

Agrawal, Jagdish M., to Michigan Consolidated Gas Company. Method for defoaming in gas purification systems. 4,287,161, Cl. 423-229.000.

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Caldwell, Godfrey P.; and Meek, Nigel W., 4,286,423, Cl. 56-6.000.

Ahad, Munir J.: *See—*
Ziv, Avraham; Tanaka, Akira; Hollowell, William; Sieber, William J.; and Ahad, Munir J., 4,287,398, Cl. 200-61.45R.

Ahne, Hellmut: *See—*
Rubner, Roland; Kuhn, Eberhard; and Ahne, Hellmut, 4,287,294, Cl. 430-306.000.

Ahrens, Paul W., to Miracle Recreation Equipment Company. Playground merry-go-round. 4,286,781, Cl. 272-33.00R.

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Aisin Seiki Kabushiki Kaisha: *See—*
Hashimoto, Kenji, 4,286,767, Cl. 251-65.000.
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AIT Industries, Inc.: *See—*
Loreto, Wilfredo P., 4,286,415, Cl. 51-284.00E.

Aitcin, Pierre C., to Universite de Sherbrooke. Novel harzburgite and preparation thereof. 4,287,167, Cl. 423-331.000.

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Bergman, Ernst L. A.; Blomberg, Peter E.; Enger, Lars S.; Reistad, Bengt R.; and Wallgren, Sonny O., 4,286,569, Cl. 126-85.00B.

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Hubertson, Folke H., 4,286,769, Cl. 251-174.000.

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Beyleveld, Wilhelmus M.; and Roskott, Lodewijk, 4,287,371, Cl. 568-563.000.

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Abel, Donald J., 4,286,632, Cl. 141-18.000.

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Kovacik, James W.; Kovacik, James D.; Blanch, Thomas J.; and Blanch, Paul S., 4,287,456, Cl. 315-283.000.

Alexander, Robert H., to Rockwell International Corporation. Fastener tools. 4,286,458, Cl. 73-862.210.

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Ahrens, Walter, 4,286,937, Cl. 425-125.000.

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Borneman, Paul R., 4,286,986, Cl. 75-126.00F.

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Allied Corporation: *See—*
Ratcliffe, Charles T., 4,287,128, Cl. 260-348.230.

Allo, Vincent F.: *See—*
Engdahl, Gerald E.; Nail, James A.; and Allo, Vincent F., 4,286,436, Cl. 62-123.000.

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Labriot, Gilbert; Bitsch, Robert; Wattelle, Michel; and Lebesue, Jean, 4,286,944, Cl. 432-14.000.

Aluminum Company of America: *See—*
Van Linden, Jan H. L.; and Gorss, Jeffrey B., 4,286,985, Cl. 75-65.00R.

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Chandrasekaran, Santosh K., 4,286,592, Cl. 128-260.000.
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AM International, Inc.: *See—*
Swift, William R.; Herrod, Don W.; and Marsh, James M., 4,287,564, Cl. 364-525.000.

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Nishio, Hiroshi; Fukano, Kazuaki; Amano, Isao; and Okumura, Osamu, 4,287,101, Cl. 252-537.000.

Amark Industries, Inc.: *See—*
Nickmeyer, Walter V., 4,287,502, Cl. 338-274.000.

Ambert, Jack: *See—*
Breda, Frederic; Jonville, Pierre; Bonomi, Angelo; and Ambert, Jack, 4,287,270, Cl. 429-103.000.

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Amemiya, Yoichi: *See—*
Nozawa, Ryoichiro; Amemiya, Yoichi; Kawamata, Mitsuo; Isohata, Shigeru; Sasaki, Takao; and Takekoshi, Yoshitaka, 4,287,460, Cl. 318-571.000.

Amend, Donald F., to Tavolek Inc. Immersion vaccine for enteric redmouth. 4,287,179, Cl. 424-92.000.

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Gorshe, Thomas M., 4,286,746, Cl. 229-55.000.
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Schlesinger, Sheldon I., 4,287,228, Cl. 427-54.100.

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Demchak, Richard J.; and Corso, Vito, Jr., 4,287,176, Cl. 424-78.000.
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Ziv, Avraham; Tanaka, Akira; Hollowell, William; Sieber, William J.; and Ahad, Munir J., 4,287,398, Cl. 200-61.45R.

Amon, Albert; Weil, Roger; and Heinzer, Paul, to Sipca Holding S.A. Desensitizing ink for the receiving surface of a chemical duplicating set by wet offset printing. 4,287,234, Cl. 427-150.000.

Amos, Benton H.: *See—*
Clausen, Eivind; Amos, Benton H.; and Wood, William M., 4,286,624, Cl. 137-625.190.

AMP Incorporated: *See—*
Lill, John F.; and Neff, Nelson E., 4,287,446, Cl. 310-71.000.
Litehizer, Melvin P., Jr., 4,286,381, Cl. 29-751.000.

Ancher, Jean-Francois R.: *See—*
Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Phillippe L., 4,287,351, Cl. 548-232.000.

Anchor/Darling Industries, Inc.: *See—*
Sulzer, Harry E., 4,286,693, Cl. 188-378.000.

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Prall, Paul D., 4,287,260, Cl. 428-410.000.

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Andrews, Peter: *See—*
Wollweber, Hartmund; Kolling, Heinrich; Thomas, Herbert; and Andrews, Peter, 4,287,199, Cl. 424-267.000.

Anoshko, Vladimir A.: *See—*
Godin, Eduard M.; Anoshko, Vladimir A.; Gavrilov, Anatoly N.; Akhmerov, Almas F.; Zverkov, Garik E.; Semenov, Valentin P.; Grachev, Vladimir V.; Cheparin, Valentin M.; Mikhailov, Viktor Y.; and Rybnikov, Sergei I., 4,286,450, Cl. 72-59.000.

Anthony, Alain. Toilet installation. 4,286,342, Cl. 4-321.000.

Anthony, Andrew J., to Combustion Engineering, Inc. Nuclear fuel storage apparatus for seismic areas. 4,287,426, Cl. 250-506.000.

Antoine, Martine: *See—*
Lechevallier, Christian; Cordier, Jacques; and Antoine, Martine, 4,287,045, Cl. 204-243.00R.

Anton, Otto: *See—*
Meyerle, Michael; Anton, Otto; and Ehrlinger, Friedrich, 4,286,477, Cl. 74-687.000.

Antunes, August J.: *See—*
Miller, Dye O.; Antunes, August J.; and Antunes, Jerome, 4,286,509, Cl. 99-332.000.

Antunes, Jerome: *See—*
Miller, Dye O.; Antunes, August J.; and Antunes, Jerome, 4,286,509, Cl. 99-332.000.

Aoki, Harumi. to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatic focus indicating device for camera. 4,286,850, Cl. 354-25.000.

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Kestner, Mark O.; and Stoldt, Stephen H., 4,287,236, Cl. 427-221.000.

Apura GmbH & Co.: *See—*
Baumann, Manfred; and Lohmann, Wolfgang, 4,286,515, Cl. 100-233.000.

Arano, Yasushi: *See—*
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Arbiter Systems Incorporated: *See—*
Paynter, Donald A.; and Burpee, Lee, 4,287,597, Cl. 455-12.000.

Arco Polymers, Inc.: *See—*
Fava, Ronald A., 4,287,314, Cl. 525-130.000.

Arita, Setsuo; and Sato, Takao, to Hitachi, Ltd. Information transmitting and receiving apparatus. 4,287,508, Cl. 340-150.000.

Arlt, Klaus-Peter: *See—*
Grigo, Ulrich; Morbitzer, Leo; Arlt, Klaus-Peter; Binsack, Rudolf; and Merten, Josef, 4,287,108, Cl. 260-29.1SB.

Armstrong Cork Company: *See—*
Lewis, Robert D., 4,286,955, Cl. 8-115.600.

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Otthofer, Jacob A., Jr., 4,286,518, Cl. 101-128.210.

Arnold, Dan M., to Texaco Inc. Measurement of flowing water salinity within or behind wellbore casing. 4,287,415, Cl. 250-270.000.

Asada, Masao: *See—*
Watanabe, Minoru; Oikawa, Mitsuhiro; Nishimura, Toshio; Asada, Masao; Tezuka, Masao; and Cho, Tsurahide, 4,287,229, Cl. 427-64.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Mizuno, Masayoshi; and Tsuchiya, Hiroyuki, 4,287,290, Cl. 430-205.000.
Nonaka, Kohei; Koyama, Masahiro; Gonmori, Makoto; Kimura, Takeo; and Shiga, Tetsuo, 4,287,295, Cl. 430-349.000.

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Aoki, Harumi, 4,286,850, Cl. 354-25.000.
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Asano, Junichi: *See—*
Akita, Yukio; Izumi, Hirotaka; and Asano, Junichi, 4,286,862, Cl. 355-3.0SH.

ASEA Aktiebolag: *See—*
Dahlstrom, Lars, 4,287,459, Cl. 318-568.000.

Ashworth, Denis H., to Simon Engineering Dudly Limited. Access equipment. 4,286,721, Cl. 212-199.000.

Associated Lead Inc.: *See—*
Muldrow, Charles N., Jr., 4,287,118, Cl. 260-45.75B.

Astle, Thomas W. Method and apparatus for streaking agar. 4,287,301, Cl. 435-30.000.

Ateliers des Charmilles, S.A.: *See—*
Convers, Danielle; Balleys, Francois; and Pfau, Jean, 4,287,404, Cl. 219-69.00W.

Atkinson, Gary B.; Nicks, Larry J.; and Bauer, Donald J., to United States of America, Interior. High surface area transition metal catalysts and method of preparing same. 4,287,095, Cl. 252-443.000.

Atkinson, John, to Coles Cranes Limited. Counterweight removal system and method. 4,286,720, Cl. 212-178.000.

Atkinson, John H., Jr., to Advanced Solar Power Company (ASPCO). Solar energy conversion system. 4,286,581, Cl. 126-439.000.

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Curtin, Daniel J., 4,287,051, Cl. 208-254.00H.
Mameniskis, Walter A.; and Melpolder, Frank W., 4,287,132, Cl. 260-453.00P.

Ato Chimie: *See—*
Gilbert, Maric, 4,287,093, Cl. 252-429.00B.

Atomic Energy of Canada Ltd.: *See—*
Torok, John, 4,287,002, Cl. 134-3.000.

Auchinleck, Richard J., to Peripheral Dynamics, Inc. Reader with special means for transporting cards and badges of variable thicknesses. 4,287,409, Cl. 235-475.000.

Avant Modes, Inc.: *See—*
MacPherson, James A.; and Schwartz, Joseph, 4,286,400, Cl. 40-152.000.

Avery International Corporation: *See—*
Wong, K. Lim; and Schmidt, Gustav A., 4,287,255, Cl. 428-343.000.

Awano, Takeshi: *See—*
Maekawa, Naozane; and Awano, Takeshi, 4,286,804, Cl. 280-803.000.

Axelsson, Holger; and Siggelin, Lars, to Aktiebolaget Bofors. Hole grinding machine. 4,286,413, Cl. 51-3.000.

Aya, Norimoto: *See—*
Matsuzaki, Kiyoto; and Aya, Norimoto, 4,286,980, Cl. 65-106.000.

Ayres, Robert L., to Rockwell International Corporation. Kingpin assembly and method for making same. 4,286,799, Cl. 280-96.100.

Aztec Tools, Inc.: *See—*
Bolding, Benson H., Jr., 4,286,659, Cl. 166-205.000.
Bolding, Benson H., Jr., 4,286,664, Cl. 166-325.000.

B. F. Goodrich Company, The: *See—*
Pond, James W., Jr., 4,286,644, Cl. 152-354.00R.

Babcock & Wilcox Company, The: *See—*
Pocock, Robert E., 4,286,472, Cl. 73-863.240.

Babin, Lucien; and Clausse, Daniele, to Elf France. Product suitable for the storage and conveyance of thermal energy. 4,287,076, Cl. 252-70.000.

Babington, Ronald G.; Harrington, F. Eugene; and Houlihan, William J., to Sandoz, Inc. Method of inhibiting prolactin secretion. 4,287,196, Cl. 424-251.000.

Bachli, Ernst, to BBC Brown, Boveri & Company Limited. Screw coupling safety mechanism. 4,286,807, Cl. 285-89.000.

Bachmann, Gunter: *See—*
Ebert, Hermann; and Bachmann, Gunter, 4,286,889, Cl. 400-697.100.

Bachmann, Horst, to Langenstein & Schemann Aktiengesellschaft. Apparatus for forging shaft flanges. 4,286,454, Cl. 72-356.000.

Bachmann, Klaus J.; and Ryan, Charles T., to Bell Telephone Laboratories, Incorporated. Opto-electronic devices based on bulk crystals of complex semiconductors. 4,287,527, Cl. 357-30.000.

Baer, Karl; Reiss, Wolfgang; Schroeder, Wolfgang; and Voges, Dieter, to BASF Aktiengesellschaft. Preparation of catalysts for the hydrogenation of acetylene-alcohols. 4,287,099, Cl. 252-465.000.

Bailey, Alan C.; and Miller, Stephen B., to Corning Glass Works. Method for substantially continuously drying, consolidating and drawing an optical waveguide preform. 4,286,978, Cl. 65-3.00A.

Bailey, Albert C. Centrifugal concentrator. 4,286,748, Cl. 233-1.00D.

Baker, Eugene E.; and Carter, Ernest E., Jr., to Halliburton Company. Isolation packer and methods of cementing from a floating vessel. 4,286,658, Cl. 166-186.000.

Baker Industries, Inc.: *See—*
Raber, Samuel; Wynne, John M.; and Heim, Alan M., 4,287,515, Cl. 340-584.000.

Baker, Robert A., to Engineered Products, Inc. Body-attachable bag for carrying cameras or the like. 4,286,697, Cl. 190-48.000.

Balleys, Francois: *See—*
Convers, Danielle; Balleys, Francois; and Pfau, Jean, 4,287,404, Cl. 219-69.00W.

Balogh, Barnabas: *See—*
Fabian, Zsolt; Samu, Mihaly; and Balogh, Barnabas, 4,287,470, Cl. 324-61.00R.

Baltz, Gene F.; and DuBois, Chester G., to Outboard Marine Corporation. Integrated fuel primer and crankcase drain system for internal combustion engine. 4,286,553, Cl. 123-187.50R.

Bang, Chang; and Row, Scott, to Korus, Inc. Valve. 4,286,618, Cl. 137-408.000.

Banks, David, to American Optical Corporation. Tape head mount. 4,287,543, Cl. 360-109.000.

Banner Industries, Inc.: *See—*
Mehesan, Thomas C., Jr., 4,286,917, Cl. 414-704.000.

Barber, Herbert L., to Double Backgammon Enterprises, Inc. Four player backgammon. 4,286,787, Cl. 273-248.000.

Bargues, Denis: *See—*
Couderc, Georges; Cojan, Yves; and Bargues, Denis, 4,287,412, Cl. 250-203.00R.

Barnie, James W.: *See—*
Rudko, Robert I.; and Barnie, James W., 4,287,483, Cl. 331-94.5PE.

Barrat, Christian R.: *See—*
Tolfo, Flavio; and Barrat, Christian R., 4,287,082, Cl. 252-174.120.

Barry Wright Corporation: *See—*
Keatley, James, 4,286,642, Cl. 411-112.000.
Peterson, Robert R., 4,286,442, Cl. 64-31.000.
Peterson, Robert R.; and Ventura, Daniel S., 4,286,827, Cl. 308-26.000.

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Baer, Karl; Reiss, Wolfgang; Schroeder, Wolfgang; and Voges, Dieter, 4,287,099, Cl. 252-465.000.
Brunner, Erwin; Schubert, Eckart; Lindner, Alfred; Merger, Franz; Volkamer, Klaus; Strohmeyer, Max; and Sandrock, Gerhard, 4,287,379, Cl. 585-839.000.
Buethe, Ingolf; and Loch, Werner, 4,287,039, Cl. 204-159.190.
Hahn, Klaus; Rath, Hans P.; and Walter, Manfred, 4,287,258, Cl. 428-407.000.
Horn, Dieter; Daubach, Ewald; Hahn, Erwin; Uhrig, Herbert; Hoene, Richard; and Naarmann, Herbert, 4,286,959, Cl. 8-524.000.
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Kuesters, Werner; and Thil, Lucien, 4,287,367, Cl. 568-43.000.
Rudolf, Peter; Steck, Werner; Koester, Eberhard; Ohlinger, Manfred; and Jaeckh, Christof, 4,287,233, Cl. 427-127.000.
Theysohn, Rainer; Zeitler, Gerhard; Weiss, Frank; Willing, Hans; and Seiler, Erhard, 4,287,117, Cl. 260-42.460.
Weitz, Hans-Martin; and Fischer, Rolf, 4,287,356, Cl. 560-244.000.

BASF Wyandotte Corporation: *See—*
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Bashnin, Oleg I.; Semenov, Vasily V.; Fedorov, Vasily N.; Rodionov, Evgeny I.; Davidson, Boris A.; and Schegolev, Gleb S. Apparatus for automatically controlling the active power produced by the generator of a hydraulic turbine-generator unit. 4,287,429, Cl. 290-40.00C.

Bassani, Mariano. Apparatus for detwisting textile fabrics in rope form. 4,286,428, Cl. 57-1.0UN.

Batcheller, Roy W., to CraneVeyor Corporation. Method of erection of pipe rail jointing system. 4,286,372, Cl. 29-516.000.

Bateman, John M.: *See—*
Peters, Thomas E.; and Bateman, John M., 4,287,140, Cl. 264-23.000.

Batista, Armando: *See—*
Coburn, Robert A.; Evans, Richard T.; Genco, Robert J.; and Batista, Armando, 4,287,191, Cl. 424-230.000.

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Atkinson, Gary B.; Nicks, Larry J.; and Bauer, Donald J., 4,287,095, Cl. 252-443.000.

Bauer, James J.; and Chichester, Willard L., to Clark Equipment Company. Hydraulic control system for operating multiple remote devices with a minimum number of connecting conduits. 4,286,692, Cl. 187-9.00R.

Baumann, Erich; Mente, Hans-Peter; and Muller, Wolfgang, to Pfauter, Hermann. Drive system for a workpiece table of a machine tool. 4,286,479, Cl. 74-724.000.

Baumann, Manfred; and Lohmann, Wolfgang, to Apura GmbH & Co. Compacting waste basket. 4,286,515, Cl. 100-233.000.

Baur, Kenneth R.: *See—*
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Bausch & Lomb Incorporated: *See—*
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Baxter Travenol Laboratories, Inc.: *See—*
Gajewski, Henry M.; Grode, Gerald A.; Measells, Paul E.; and Miripol, Jeffrey E., 4,286,597, Cl. 128-272.000.
Thomas, William R., 4,287,180, Cl. 424-101.000.

Bayer Aktiengesellschaft: *See—*
Becker, Hans-Joachim; and Schmidt, Walter, 4,287,365, Cl. 564-422.000.
Ehrig, Volker; Groll, Manfred; and Wunderlich, Klaus, 4,286,962, Cl. 8-549.000.
Engelhard, Forest; Kuhn, Rainer; Pump, Wichard; Riess, Reinhard; and Streib, Hugo, 4,287,262, Cl. 428-461.000.
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Schlak, Ottfried; Moretto, Hans-Heinrich; Clarenz, Werner; Peltzer, Bernd; and Burgmer, Willi, 4,287,109, Cl. 260-29.20M.
Wollweber, Hartmund; Kolling, Heinrich; Thomas, Herbert; and Andrews, Peter, 4,287,199, Cl. 424-267.000.
Zahner, Hans; Holst, Hartwig; Zoebelein, Gerhard; and Keckeisen, Adelinde, 4,287,186, Cl. 424-181.000.

Bayley, Robert D., to Xerox Corporation. Magnetic toner composition and a method of making the same. 4,287,281, Cl. 430-107.000.

BBC Brown, Boveri & Company Limited: *See—*
Bachli, Ernst, 4,286,807, Cl. 285-89.000.
Vitins, Michael, 4,287,547, Cl. 361-82.000.

Beaird-Poulan Division of Emerson Electric Co.: *See—*
Tuggle, Lloyd H., 4,286,675, Cl. 173-163.000.

Bechstedt, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Fluid, cold-stable, two-component washing compositions. 4,286,956, Cl. 8-137.000.

Beck, Bernhard: *See—*
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Beck, Jean-Louis: *See—*
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Beck, Thomas L.; and Tennessen, Rick L., to Unico, Inc. Veneer lathe control system. 4,287,462, Cl. 318-571.000.

Becker, Hans-Joachim; and Schmidt, Walter, to Bayer Aktiengesellschaft. Reduction of aromatic nitro compounds with Raney nickel catalyst. 4,287,365, Cl. 564-422.000.

Beckmann, Robert M., to Motorola, Inc. Frequency synthesizer with ROM controlled divider and display. 4,287,600, Cl. 455-158.000.

Becton, Dickinson and Company: *See—*
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Bedient, Marvin J., to Swan, John. Water system freeze protection apparatus. 4,286,617, Cl. 137-334.000.

Beecher, Jesse S., to Drew Chemical Corporation. Water treatment by ion exchange resin. 4,287,072, Cl. 210-668.000.

Beer, Margaret: *See—*
Beer, Walter R.; and Beer, Margaret, 4,287,388, Cl. 179-1.0DD.

Beer, Walter R.; and Beer, Margaret. Drive-in theatre sound distribution system. 4,287,388, Cl. 179-1.0DD.

Beers, Robert E. Folding furniture. 4,285,831, Cl. 312-258.000.

Beggs, Daniel H. Sound and light signaling system. 4,287,509, Cl. 340-326.000.

Behrenz, Wolfgang: *See—*
Fuchs, Rainer; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,287,208, Cl. 424-304.000.

Belcher, Jewell G., Jr.; and Hollis, Ben R., Jr., to United States of America, National Aeronautics and Space Administration. Liquid immersion apparatus for minute articles. 4,286,542, Cl. 118-423.000.

Bell & Howell Company: *See—*
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Bell Telephone Laboratories, Incorporated: *See—*
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Buckler, Michael J.; Kummer, Raymond B.; Mettler, Stephen C.; and Miller, Calvin M., 4,286,979, Cl. 65-3.00A.
Langseth, Rollin E.; and Yeh, Yu S., 4,287,598, Cl. 455-52.000.
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Belsky, Arkady A.; Eljutin, Alexandr V.; Zubkov, Valery N.; Konjukov, Alexandr I.; Krasinskaya, Lidia I.; Nekrasova, Elena A.; Nizharadze, Konstantin S.; Markova, Larisa F.; Mirskaya, Mirra G.; Frolov, Alexei V.; and Judin, Evgeny A. Process for producing high-purity indium. 4,287,030, Cl. 204-105.00R.

Benatar, Victor. System for automatically injecting a measured quantity of powdered reagent into a pool of molten metal. 4,286,774, Cl. 266-82.000.

Bendix Corporation, The: *See—*
Braunlich, Peter F., 4,287,553, Cl. 361-283.000.
Fahim, Magdi M.; Nowak, Victor J.; and Matta, Nagui R., 4,286,563, Cl. 123-469.000.
Moser, Kenneth R., 4,287,603, Cl. 455-293.000.
Rudolph, Pamela; Krieder, Robert D.; and O'Keefe, Patrick J., Jr., 4,286,685, Cl. 180-176.000.
Young, Allen E., 4,286,880, Cl. 356-431.000.

Benichou, Alain; and Perraud, Raymond J., to S.A.E.I. Celite; and Societe d'Etude et de Construction de Machines pour Toutes Industries SECOMA. Process for positioning strengthening rods in mine levels and public works. 4,286,899, Cl. 405-260.000.

Benier B.V.: *See—*
Benier, Johan, 4,286,939, Cl. 425-333.000.
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Benjamin, John W., to Litton Systems, Inc. Semi-automated warehousing system. 4,286,911, Cl. 414-273.000.
Bennett, Lewis W.; and Van Namen, Frederik T., to Centronics Data Computer Corp. Bi-directional belt drive, print head mounting means and printing plane adjustment means for serial printers. 4,286,888, Cl. 400-320.000.
Benno, Edward L.: *See—*
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Berger, Hermann, to U.S. Philips Corp. Amplifier arrangement comprising two transistors. 4,287,478, Cl. 330-256.000.
Berggren, Torsten L. Screw-press. 4,286,512, Cl. 100-74.000.
Berghmans, Jacques M. L., to Du Pont de Nemours, E. I., and Company. Coating of poly(arylene sulfide), fluoropolymer and aluminum flake. 4,287,112, Cl. 260-29.60F.
Bergman, Ernst L. A.; Blomberg, Peter E.; Enger, Lars S.; Reistad, Bengt R.; and Wallgren, Sonny O., to Aktiebolaget Electrolux. Intake and discharge duct with external terminal for a burner-operated refrigerator. 4,286,569, Cl. 126-85.00B.
Bergstein, David. Roller skating spark generator. 4,286,806, Cl. 280-816.000.
Bergwerksverband GmbH: *See—*
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Bernath, Oskar, to Georg Fischer Brugg-Oehler AG. Apparatus for strengthening porous plates by impregnation. 4,286,540, Cl. 118-50.000.
Bernuth, Wolfgang: *See—*
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Bethlehem Steel Corporation: *See—*
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Burcaw, Kenneth R., Jr.; and Watkins, Robert E., Jr., 4,286,971, Cl. 55-48.000.
Stavros, Anthony J., 4,287,238, Cl. 427-349.000.
Torok, Theodore E.; Shin, Paik W.; and Borzillo, Angelo R., 4,287,008, Cl. 148-127.000.
Vander Voort, George F., 4,287,007, Cl. 148-36.000.
Beucci, Marcello, to Gori & Zucchi S.p.A. Apparatus for seeking and following a luminous zone, such as the sun. 4,287,411, Cl. 250-203.00R.
Bewley, James G., to Metallurgical International, Inc. Powdered metal filter composition and processes for producing the same. 4,287,068, Cl. 210-510.000.
Beyer, Horst, to Goetze AG. Method for inoculating or refining metal melts. 4,286,646, Cl. 164-57.100.
Beyleveld, Wilhelmus M.; and Roskott, Lodewijk, to Akzona Incorporated. Novel peroxyketals derived from alkoxyacetones. 4,287,371, Cl. 568-563.000.
BFG Glassgroup: *See—*
Vasseur, Jean-Pierre; Laureni, Michel; Loriau, Jean-Joseph; and Delhaute, Andre, 4,286,743, Cl. 228-124.000.
Bianchetta, Donald L.; and Wirtz, Edward A., to Caterpillar Tractor Co. Hydraulic load lifting system with automatic blocking valve. 4,286,502, Cl. 91-445.000.
Biles, Don L.; and Richardson, A. Alan, to Silver Systems, Ltd. Silver recovery apparatus. 4,287,044, Cl. 204-231.000.
Billenstein, Siegfried: *See—*
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Binsack, Rudolf: *See—*
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Bittle, James L., to Pitman-Moore, Inc. Feline rhinotracheitis vaccine and production and use thereof. 4,287,178, Cl. 424-89.000.
Bixby, James A.; Lemke, James U.; and Lentz, Robert A., to Spin Physics, Inc. Segmented video recording with segment identification codes. 4,287,539, Cl. 360-18.000.
Black Clawson Company, The: *See—*
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Blackwood, Robert S., to FSI Corporation. Applying photoresist onto silicon wafers. 4,286,541, Cl. 118-52.000.
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Blanch, Thomas J.: *See—*
Kovacik, James W.; Kovacik, James D.; Blanch, Thomas J.; and Blanch, Paul S., 4,287,456, Cl. 315-283.000.
Blaney, Peter G.: *See—*
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Blass, Karl G. Electrochemical detection procedure for the determination of glucose in biological fluids. 4,287,028, Cl. 204-1.00T.
Blevins, Willard A.: *See—*
Swift, Billy K.; Zizzo, Anthony F.; and Blevins, Willard A., 4,287,480, Cl. 331-1.00A.
Blitz, James E. Temperature control system for automotive storage components. 4,286,551, Cl. 123-41.310.
Block, Kenneth A.; Carter, William M.; and Schillreff, George H., to General Dynamics, Pomona Division. Decoy rounds and their method of fabrication. 4,286,498, Cl. 86-1.00R.
Blomberg, Peter E.: *See—*
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Blount, Eric A., to Marconi Company Limited, The. Manipulator mechanisms. 4,286,380, Cl. 29-741.000.
Bluestein, Ben A., to General Electric Company. Process for synthesizing silanol chain-stopped fluorosiloxane fluids. 4,287,353, Cl. 556-459.000.
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Blume, Helmut: *See—*
Hackert, Karl-Heinz; and Blume, Helmut, 4,287,223, Cl. 427-9.000.
Blumenfeld, John F.: *See—*
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Boehringer, Wilfred E., to McDonnell Douglas Corporation. Hydraulic power transfer unit. 4,286,927, Cl. 417-271.000.
Boeing Company, The: *See—*
Falcioni, Joseph G., 4,286,371, Cl. 29-509.000.
Lund, Walter W., Jr.; Nalos, Ervin J.; and Skoumal, Donald E., 4,287,495, Cl. 333-239.000.
Boersma, Richard F., to Fiat-Allis Construction Machinery, Inc. Scraper elevator drive mounting. 4,286,705, Cl. 198-719.000.
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Rudy, Marion F., 4,287,250, Cl. 428-166.000.
Bohm, Martin: *See—*
Ritter, Ernst; Schwartz, Reinhard; Muller, Rolf; and Bohm, Martin, 4,286,559, Cl. 123-383.000.
Boileau, Jacques, to Compagnie Generale des Etablissements Michelin. Pneumatic tire with reinforced carcass and tread. 4,286,645, Cl. 152-360.000.
Bolding, Benson H., Jr., to Aztec Tools, Inc. Ball valve safety screen. 4,286,659, Cl. 166-205.000.
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Bollenbacher, Dale E. Signal viewer for automobile. 4,286,846, Cl. 350-436.000.
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Fiske, Augustus H., Jr., 4,286,687, Cl. 181-120.000.
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Thornton, Alan; and Uttley, John S., 4,287,246, Cl. 428-113.000.
Bonomi, Angelo: *See—*
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Booth, Elwood F., Jr.; and Poncha, Rustom P., to Allied Chemical Corporation. Double crystallization process to produce low organic, low silica soda ash. 4,286,967, Cl. 23-298.000.

Booth, Rex, to United States of America, Energy. Strong focus space charge. 4,287,419, Cl. 250-396.0ML.

Boots Company, The: *See*—
North, Robert A., 4,287,374, Cl. 568-937.000.

Booty, Donald J., to Snow Biz, Inc. Ski boot walking accessory. 4,286,397, Cl. 36-132.000.

Bopp, Barbara A.: *See*—
Dren, Anthony T.; and Bopp, Barbara A., 4,287,192, Cl. 424-248.510.

Borg, Arthur N.; Trostel, Jerry D.; and Heuer, Daniel A., to Magnavox Company, The. Self-programing memory tuning system. 4,287,601, Cl. 455-186.000.

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Valdiserri, Leo L., 4,287,339, Cl. 544-214.000.

Borland, Walter G., to General Electric Company. Capacitive current limiting inverter. 4,287,556, Cl. 363-41.000.

Borneman, Paul R., to Allegheny Ludlum Steel Corporation. Ferritic stainless steel and processing therefor. 4,286,986, Cl. 75-126.00F.

Borrer, Manfred, to Licentia Patent-Verwaltungs-G.m.b.H. Solid state circuit. 4,286,842, Cl. 350-331.00R.

Borvendeg, Janos: *See*—
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Allegra, Louis K.; Townsend, Herbert E.; and Borzillo, Angelo R., 4,287,009, Cl. 148-127.000.
Torok, Theodore E.; Shin, Paik W.; and Borzillo, Angelo R., 4,287,008, Cl. 148-127.000.

Botnick, Irlin H. Non-freeze wall hydrant. 4,286,616, Cl. 137-327.000.

Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Phillippe L., to Delalande S.A. 3-Parahydroxyphenyl-5-methylether-2-oxazolidinone compounds. 4,287,351, Cl. 548-232.000.

Bourne, Ian A., to University of Melbourne, The. Acoustic detection of wind speed and direction at various altitudes. 4,286,462, Cl. 73-189.000.

Boute, Raymond T. G.; De Kinder, Wilfried L. J.; Neutjens, Gustaaf W. T.; Pochet, Andre G. G.; Vanderschoot, Jan P. M.; and Van Remortel, Jacques D. A., to International Standard Electric Corporation. Time division multiplex communication system. 4,287,590, Cl. 370-59.000.

Bowman, Edward: *See*—
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Ehretsmann, Jacques; Cowling, Robert D.; Schweizer, Alfred D.; Caldwell, William M.; Boyd, Dennis F.; and Boyd, Robert J., 4,286,604, Cl. 131-359.000.

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Boyd, Thomas J., Jr.: *See*—
Brau, Charles A.; Swenson, Donald A.; and Boyd, Thomas J., Jr., 4,287,488, Cl. 331-94.5PE.

Boyd, William J.: *See*—
King, Mary K.; and Boyd, William J., 4,287,251, Cl. 428-198.000.

Bracke, William J. I.; and Lanza, Emmanuel, to Labofina S.A. Process for preparing rubber reinforced styrenic resins. 4,287,318, Cl. 525-313.000.

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Bradley, Irving, to General Electric Company. Mechanical stop means for a prefocused plastic PAR lamp. 4,287,448, Cl. 313-113.000.

Brady, Thomas P.: *See*—
Langer, Horst G.; and Brady, Thomas P., 4,287,131, Cl. 260-448.00R.

Braeger, Horst K. H., to Nordischer Maschinenbau Rud. Baader GmbH & Co. KG. Method of filleting fish and a filleting machine for performing this method. 4,286,355, Cl. 17-46.000.

Braksmayer, Diza P.; and Hussain, Syed N., to FMC Corporation. 3-Hydroxyalkyl phosphine oxide flame retardant compositions. 4,287,119, Cl. 260-45.95L.

Brantingham, George L.: *See*—
Easley, Steven J.; and Brantingham, George L., 4,287,559, Cl. 364-200.000.

Brash, Leslie O. Gas recirculation apparatus with integral ash hoppers. 4,286,548, Cl. 122-1.00R.

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Braunlich, Peter F., to Bendix Corporation, The. Capacitive pressure transducer. 4,287,553, Cl. 361-283.000.

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Breitschwerdt, Werner: *See*—
Scherenberg, Hans O.; Breitschwerdt, Werner; Klein, Wilhelm; and Jahn, Walter, 4,286,359, Cl. 24-230.00R.

Bremmer, James S. Process of manufacturing stable ammonium polyphosphate fertilizers. 4,286,982, Cl. 71-34.000.

Bres, Philippe; Berge, Christian; and Sassus-Bourda, Gerard, to Societe Nationale Elf Aquitaine (Production). Method and device for in situ detection of a mineral deposit fluid within a borehole. 4,286,461, Cl. 73-155.000.

Brewer, John H., to Becton, Dickinson and Company. Apparatus for generation of anaerobic atmosphere. 4,287,306, Cl. 435-287.000.

Brinkhous, Kenneth M.; and Read, Marjorie S., to Research Triangle Institute. Fixed-dried blood platelets. 4,287,087, Cl. 252-408.000.

British Aerospace Public Limited Company: *See*—
Trayner, Brian T., 4,286,522, Cl. 102-255.000.

British Petroleum Company Limited, The: *See*—
Melitz, Daniel T.; Searle, Kenneth L.; and Woodman, Brian E., 4,286,896, Cl. 405-185.000.

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Montgomery, Robert W., 4,287,381, Cl. 13-18.00C.

Brooks, Clyde S.: *See*—
Golden, Gerald S.; Lemkey, Franklin D.; and Brooks, Clyde S., 4,287,096, Cl. 252-455.00R.

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Brother Kogyo Kabushiki Kaisha: *See*—
Hisakawa, Minoru; and Okamoto, Tsugio, 4,286,887, Cl. 400-196.100.

Brown, George A.; Relyea, Lloyd A.; Scharfe, Merlin E.; and Pinsler, Heinz W., to Xerox Corporation. Overcoated inorganic layered photoresponsive device and process of preparation. 4,287,279, Cl. 430-58.000.

Brown, Omar L.: *See*—
Fraze, Ermal C.; and Brown, Omar L., 4,286,728, Cl. 220-270.000.

Brown, Raymond C., to Superior Industries International, Inc. Wheel with replacement spokes. 4,286,824, Cl. 301-37.0SS.

Brown, William J., to Caterpillar Tractor Co. Mount to absorb shocks. 4,286,777, Cl. 267-63.00R.

Bruck, Rolf: *See*—
Himmelmann, Wolfgang; Bruck, Rolf; Sauerteig, Wolfgang; Kruck, Peter; Kolb, Gunter; and Sackmann, Gunter, 4,287,299, Cl. 430-537.000.

Brunner, Erwin; Schubert, Eckart; Lindner, Alfred; Merger, Franz; Volkamer, Klaus; Strohmeyer, Max; and Sandrock, Gerhard, to BASF Aktiengesellschaft. Process for obtaining isobutene from C_4-hydrocarbon mixtures containing isobutene. 4,287,379, Cl. 585-839.000.

Brunsting, Albert: *See*—
Hogg, Walter R.; and Brunsting, Albert, 4,286,876, Cl. 356-343.000.

Buchold, Henning: *See*—
Moller, Friedrich-Wilhelm; Buchold, Henning; Klein, Helmut; Garkisch, Otto-Ludwig; Gutlhuber, Friedrich; and Laber, Walter, 4,287,375, Cl. 585-440.000.

Buckler, Michael J.; Kummer, Raymond B.; Mettler, Stephen C.; and Miller, Calvin M., to Bell Telephone Laboratories, Incorporated. Fabrication of optical fibers using differential mode-group delay measurement. 4,286,979, Cl. 65-3.00A.

Buckner, Lynn A. Direct contact gaseous to liquid heat exchange and recovery system. 4,287,138, Cl. 261-128.000.

Buckwalter, Geoffrey R., to Simon, Eric. Grinding of pigments. 4,287,000, Cl. 106-309.000.

Budd Company, The: *See*—
Mekosh, George, Jr.; and Hulse, David O., 4,286,797, Cl. 280-80.00B.

Buder, Wolfgang: *See*—
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Budich, Wolfgang; and Theissen, Hans, to Dynamit Nobel Aktiengesellschaft. Building kit for vertical or horizontal sliding windows. 4,286,716, Cl. 206-577.000.

Buethe, Ingolf; and Loch, Werner, to BASF Aktiengesellschaft. Radiation-curable aqueous binder dispersions, their preparation and their use. 4,287,039, Cl. 204-159.190.

Bugler, John H.: *See*—
Goslin, John K.; Bugler, John H.; and Foster, Howard, 4,286,605, Cl. 131-358.000.

Burcaw, Kenneth R., Jr.; and Watkins, Robert E., Jr., to Bethlehem Steel Corporation. Removal of naphthalene from recirculated wash oil. 4,286,971, Cl. 55-48.000.

Burdett, Kenneth A.: *See*—
Tefertiller, Nancy B.; Burdett, Kenneth A.; and Harris, Robert F., 4,287,323, Cl. 525-404.000.

Burgmer, Willi: *See*—
Schlak, Ottfried; Moretto, Hans-Heinrich; Clarenz, Werner; Peltzer, Bernd; and Burgmer, Willi, 4,287,109, Cl. 260-29.20M.

Burke, William R.: *See*—
Smith, Richard E.; and Burke, William R., 4,286,995, Cl. 106-109.000.

Burns, Joseph P., to ICI Americas Inc. Polyester urethane-containing molding compositions. 4,287,116, Cl. 260-37.00N.

Burpee, Lee: *See*—
Paynter, Donald A.; and Burpee, Lee, 4,287,597, Cl. 455-12.000.

Burr Oak Tool & Gauge Company: *See*—
Franks, Lawrence A., 4,286,486, Cl. 83-23.000.

Burrafato, Gary M.: *See*—
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Burron Medical Inc.: *See*—
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Raines, Kenneth, 4,287,065, Cl. 210-445.000.

Burroughs Corporation: *See*—
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Paulish, Daniel J.; Meyerhoff, Albert J.; and Nickett, George R., 4,287,592, Cl. 370-88.000.
Wertanen, Harry, 4,286,516, Cl. 101-93.030.
Burroughs Wellcome Co.: *See*—
Schaeffer, Howard J., 4,287,188, Cl. 424-200.000.
Burrows, Clifford G.: *See*—
Butler, Claude O.; and Burrows, Clifford G., 4,286,798, Cl. 280-81.500.
Burrows, J. W.; and Watts, Loyal O., to Caterpillar Tractor Co. Lock valve with variable length piston and hydraulic system for a work implement using the same. 4,286,432, Cl. 60-404.000.
Burwasser, Herman, to GAF Corporation. Toner repellant coating for dielectric film. 4,287,286, Cl. 430-127.000.
Busbach, Wilhelm: *See*—
Galow, Manfred; and Busbach, Wilhelm, 4,286,912, Cl. 414-287.000.
Buser, Rolf; Palacin, Francis; Robert, Georg; and Somm, Franz, to Sandoz Ltd. Reduction clearing of disperse dyes. 4,286,961, Cl. 8-532.000.
Bushelle, William R.: *See*—
Van Vliet, Robert M.; and Bushelle, William R., 4,287,520, Cl. 343-909.000.
Busse, Claus-Adolf; and Labrande, Jean-Paul, to Zewen, Cabinet A. Gas-controlled heat-pipe thermostat of high precision. 4,286,652, Cl. 165-96.000.
Butler, Claude O.; and Burrows, Clifford G. Truck with steerable rear wheels. 4,286,798, Cl. 280-81.500.
BWM Corporation: *See*—
Medcalf, Eugene C., 4,286,969, Cl. 44-53.000.
BWZ Berg-und Industrietechnik GmbH: *See*—
Marsch, Walter; and Werner, Hans, 4,286,482, Cl. 81-55.000.
Bytzek, Max: *See*—
Hammer, Klaus-Dieter; Schroder, Martin; Pietruck, Horst; and Bytzek, Max, 4,287,217, Cl. 426-105.000.
C-I-L Inc.: *See*—
Pollock, David C. I., 4,287,070, Cl. 210-626.000.
Caldwell, Godfrey P.; and Meek, Nigel W., to Agrimech Engineering Ltd. Crop cutting apparatus. 4,286,423, Cl. 56-6.000.
Caldwell, William M.: *See*—
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Calspan Corporation: *See*—
Weibel, James A., Sr.; and Vassallo, Franklin A., 4,287,033, Cl. 204-146.000.
Cambridge Engineering, Inc.: *See*—
Searcy, James A.; Zoellner, Roger O.; and Hoffmann, Ronald C., 4,286,572, Cl. 126-299.00D.
Campillo, Anthony J.: *See*—
Clark, John H.; Campillo, Anthony J.; Shapiro, Stanley L.; and Winn, Kenneth R., 4,287,035, Cl. 204-157.10R.
Canada, Her Majesty the Queen in right of, as represented by the Minister of Natural Resources: *See*—
Novak, Milan; and Adams, William F., 4,286,404, Cl. 43-87.000.
Cankurt, Nurettin T.; and Furman, Anthony H., to General Electric Company. Reactor with particulate recycling filtration means. 4,286,970, Cl. 48-87.000.
Cann, Peter L.; and Sacks, Paul S., to Carrier Corporation. Hot gas defrost system. 4,286,435, Cl. 62-81.000.
Canon Kabushiki Kaisha: *See*—
Kamata, Shigeru, 4,286,845, Cl. 350-430.000.
Kiuchi, Masayoshi; and Kawamura, Masaharu, 4,286,858, Cl. 354-289.000.
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Uchidoi, Masanori; Shimizu, Masami; Date, Nobuaki; and Aizawa, Hiroshi, 4,286,849, Cl. 354-23.00D.
Capaccio, Giancarlo; and Ward, Ian M., to National Research Development Corp. Process for the production of polymer materials. 4,287,149, Cl. 264-210.700.
Caputo, Charles A.: *See*—
Schwab, Carl E.; Foley, Peter; and Caputo, Charles A., 4,287,533, Cl. 358-127.000.
Carballes, Jean-Claude: *See*—
Huignard, Jean-Pierre; Leclerc, Pierre; Carballes, Jean-Claude; and Nappo, Armand, 4,286,838, Cl. 350-96.110.
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Carley, Emilie L.: *See*—
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Carlisle Corporation: *See*—
Dombrowsky, Donald S., 4,287,385, Cl. 174-36.000.
Carlo, Dennis J.; Jackson, Jesse J.; and Stoudt, Thomas H., to Merck & Co., Inc. Vaccine for dental caries. 4,287,173, Cl. 424-49.000.
Carlo Erba Strumentazione S.p.A.: *See*—
Sisti, Giorgio; Riva, Ermete; and Sala, Learco, 4,286,456, Cl. 73-23.100.
Carlos Enterprises: *See*—
Harvey, Leslie E.; and Spiva, Stephan D., 4,286,784, Cl. 273-54.00D.
Carlsen, George C., II; Crumm, John C.; and Matsuda, Koji, to Dynamic Compliance, Incorporated. Feedback arrangement. 4,287,477, Cl. 330-255.000.
Carre, Jean-Jacques; and Levrai, Roland, to Societe Anonyme D.B.A. Drum brake actuating device. 4,286,504, Cl. 91-517.000.
Carrier Corporation: *See*—
Cann, Peter L.; and Sacks, Paul S., 4,286,435, Cl. 62-81.000.
Carson, William W., to Waters Associates, Inc. Refractometer cell with integral lens. 4,286,873, Cl. 356-130.000.
Carter, Ernest E., Jr.: *See*—
Baker, Eugene E.; and Carter, Ernest E., Jr., 4,286,658, Cl. 166-186.000.
Carter, William M.: *See*—
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Casinelli, Dominic L., to Harrell, James E., a part interest. Solid fuel composition. 4,286,968, Cl. 44-1.00R.
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Moro, Alessandro; Foa, Marco; and Cassar, Luigi, 4,287,352, Cl. 549-79.000.
Castelli, Vincent J.; and Fischer, Eugene C., to United States of America, Navy. Copper base antifouling paints with pH control. 4,286,988, Cl. 106-15.050.
Castelli, Vittorio; and Hamaker, Ralph A., to Xerox Corporation. Belt tracking system. 4,286,706, Cl. 198-806.000.
Catalyst Research Corporation: *See*—
Harney, David E.; Harney, Marilyn J.; and O'Boyle, Matthew, 4,287,273, Cl. 429-153.000.
Caterpillar Tractor Co.: *See*—
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Bianchetta, Donald L.; and Wirtz, Edward A., 4,286,502, Cl. 91-445.000.
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Kessinger, Orville E., Jr., 4,286,478, Cl. 74-705.000.
Noble, Charles M.; and Olthoff, James A., 4,286,674, Cl. 172-811.000.
Sieving, Alfred W., 4,286,825, Cl. 301-63.00R.
Catiller, Robert D.: *See*—
Forbes, Brian K.; and Catiller, Robert D., 4,287,560, Cl. 364-200.000.
Cavaliere, Joseph R.; Henle, Robert A.; Konian, Richard R.; and Walsh, James L., to International Business Machines Corp. Complementary transistor inverting emitter follower circuit. 4,287,435, Cl. 307-255.000.
Cavallaro, Antonino: *See*—
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Cave, David L.; and Pace, Wilson D., to Motorola, Inc. Field effect transistor current source. 4,287,438, Cl. 307-297.000.
Cazzaro, Giorgio; Matera, Giancarlo; Cavallaro, Antonino; and Zani, Marina, to Snia Viscosa. Process for producing glossy fibres of the modacrylic type having reduced inflammability. 4,287,148, Cl. 264-182.000.
Celmer, Walter D.; Cullen, Walter P.; Huang, Liang H.; Oscarson, John R.; Shibakawa, Riichiro; and Tone, Junsuke, to Pfizer Inc. Antibiotics produced by a new microbe, *Catenuloplanes japonicus*. 4,287,182, Cl. 424-118.000.
Cendre, Andre: *See*—
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Centronics Data Computer Corp.: *See*—
Bennett, Lewis W.; and Van Namen, Frederik T., 4,286,888, Cl. 400-320.000.
Cessna Aircraft Company, The: *See*—
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Tinney, Francis J.; Connor, David T.; Cetenko, Wiaczeslaw A.; Kerbleski, Joseph J.; and Sorenson, Roderick J., 4,287,340, Cl. 544-250.000.
Chakravarti, Satya N.; and Hiltebeitel, John A., to International Business Machines Corporation. High density transistor arrays. 4,287,571, Cl. 365-104.000.
Champion International Corporation: *See*—
Lee, Hong Man, 4,286,753, Cl. 238-37.000.
Zdarsky, Robert C.; and Lyons, Russell, 4,286,714, Cl. 206-526.000.
Champion Road Machinery Limited: *See*—
Dickie, Ira A., 4,286,480, Cl. 74-785.000.
Chandrasekaran, Santosh K., to ALZA Corporation. Therapeutic system for administering drugs to the skin. 4,286,592, Cl. 128-260.000.
Chang, Chin H.: *See*—
Savage, David W.; Chang, Chin H.; and Longo, John M., 4,286,972, Cl. 55-58.000.
Chang, William J. H., to Yoder Company, The. Forming leveller. 4,286,451, Cl. 72-161.000.
Chapman, Derek D.; and Reczek, James A., to Eastman Kodak Company. Photographic products and processes employing novel nondiffusible 6-arylazo-3-pyridinol magenta dye-releasing compounds and precursors thereof. 4,287,292, Cl. 430-222.000.
Charade Hair and Skin Care Center, Inc.: *See*—
Handley, Charles L.; and Ostheim, James R., 4,286,608, Cl. 132-40.000.

Chari, Venu, to NCR Corporation. Data recovery system for use with a high speed serial link between two subsystems in a data processing system. 4,287,596, Cl. 375-49.000.

Chastain, David L., Jr.: *See*—
Ledis, Stephen L.; Chastain, David L., Jr.; and Crews, Harold R., 4,286,963, Cl. 23-230.00B.

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Cheatham, Samuel D.; and Haynes, Munro K., to International Business Machines Corporation. Stabilized recording. 4,287,540, Cl. 360-18.000.

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Dohm, Klaus-Dieter; and Hofmann, Peter, 4,287,130, Cl. 260-413.000.

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Cheng, Richard C. M. Nesting track section for model vehicles. 4,286,752, Cl. 238-10.00F.

Cheng, Y. C.: *See*—
Lam, Hau C.; Lee, Thomas K. P.; and Cheng, Y. C., 4,287,513, Cl. 340-562.000.

Chepurin, Valentin M.: *See*—
Godin, Eduard M.; Anoshko, Vladimir A.; Gavrilov, Anatoly N.; Akhmerov, Almas F.; Zverkov, Garik E.; Semenov, Valentin P.; Grachev, Vladimir V.; Chepurin, Valentin M.; Mikhailov, Viktor Y.; and Rybnikov, Sergei I., 4,286,450, Cl. 72-59.000.

Chevron Research Company: *See*—
Kobzina, John W., 4,287,213, Cl. 424-331.000.
Peterson, Terry M., 4,287,383, Cl. 136-260.000.

Chicago Bridge & Iron Company: *See*—
Engdahl, Gerald E.; Nail, James A.; and Allo, Vincent F., 4,286,436, Cl. 62-123.000.
Stafford, Donald C., 4,286,898, Cl. 405-224.000.

Chichester, Willard L.: *See*—
Bauer, James J.; and Chichester, Willard L., 4,286,692, Cl. 187-9.00R.

Childers, Clifford W.: *See*—
Uber, Raymond F.; Childers, Clifford W.; and Naylor, Floyd E., 4,287,313, Cl. 525-91.000.

Chimura, Kozo: *See*—
Ogihara, Masuo; Chimura, Kozo; Shinozaki, Nobuo; and Seki, Yoichi, 4,287,586, Cl. 368-222.000.

Chisso Corporation: *See*—
Kikuta, Kazutsune; Tachibana, Masami; and Sato, Akihiro, 4,287,328, Cl. 526-115.000.

Cho, Tsurahide: *See*—
Watanabe, Minoru; Oikawa, Mitsuhiro; Nishimura, Toshio; Asada, Masao; Tezuka, Masao; and Cho, Tsurahide, 4,287,229, Cl. 427-64.000.

Christini, James N., to GTE Products Corporation. Calciner reverse feed discharge spiral. 4,286,946, Cl. 432-112.000.

Ciba-Geigy AG: *See*—
Dodwell, Geoffrey M., 4,287,298, Cl. 430-533.000.
Kitzing, Rainer; Ficken, Geoffrey E.; and Dolden, Victor W., 4,287,348, Cl. 548-121.000.

Ciba-Geigy Corporation: *See*—
Creighton, Gordon R., 4,286,365, Cl. 29-157.30V.
Eckhardt, Wolfgang; Kunz, Walter; and Hubele, Adolf, 4,287,210, Cl. 424-309.000.
Fah, Hansjakob; and Grieder, Alfred, 4,287,347, Cl. 546-345.000.
Farooq, Saleem, 4,287,204, Cl. 424-277.000.
Forgo, Imre; Zahir, Abdul-Cader; and Francois, Jacques, 4,287,106, Cl. 260-28.50B.
Hoegerle, Karl, 4,287,342, Cl. 544-298.000.
Mazour, Zdenek, 4,287,136, Cl. 260-985.000.
Petitpierre, Jean C., 4,287,336, Cl. 542-472.000.

CIDELCEM: *See*—
Marchais, Jean-Claude, 4,286,713, Cl. 206-508.000.

CL Industries, Inc.: *See*—
Stewart, Patrick H.; and Woodson, Wayne D., 4,287,092, Cl. 252-429.00R.

Claessens, Dominique F., to D.P.G. Claessens Product-Consultants B.V. Device for tobacco consumption and method of making it. 4,286,607, Cl. 131-328.000.

Clarenz, Werner: *See*—
Schlak, Ottfried; Moretto, Hans-Heinrich; Clarenz, Werner; Peltzer, Bernd; and Burgmer, Willi, 4,287,109, Cl. 260-29.20M.

Claret, Guy P. Control for electronic amplifiers. 4,286,492, Cl. 84-1.270.

Clark Equipment Company: *See*—
Bauer, James J.; and Chichester, Willard L., 4,286,692, Cl. 187-9.00R.

Clark, James A., to Bausch & Lomb Incorporated. Lens insertion and removal device. 4,286,815, Cl. 294-1.0CA.

Clark, John H.; Campillo, Anthony J.; Shapiro, Stanley L.; and Winn, Kenneth R., to United States of America, Energy. Method for producing rapid pH changes. 4,287,035, Cl. 204-157.10R.

Clarke, Clarence C., to Whirlpool Corporation. Condition responsive liquid line valve for refrigeration appliance. 4,286,438, Cl. 62-216.000.

Clarke, William L., to Laser Precision Corporation. Refractively scanned interferometer. 4,286,877, Cl. 356-346.000.

Clasen, Rolf; and Lydtin, Hans J., to U.S. Philips Corporation. Mould with separating layer for the production of glass objects. 4,286,981, Cl. 65-169.000.

Clausen, Eivind; Amos, Benton H.; and Wood, William M. Fluid handling systems & multi-positionable valving arrangements for the use therein. 4,286,624, Cl. 137-625.190.

Clausse, Daniele: *See*—
Babin, Lucien; and Clausse, Daniele, 4,287,076, Cl. 252-70.000.

Clay, Robert A., to Hermann, Robert R. Pumping unit. 4,286,928, Cl. 417-329.000.

Cleveland Controls, Incorporated: *See*—
McMahon, James F., Jr., 4,286,474, Cl. 74-522.000.

Clubley, Michael H.: *See*—
Farnworth, Frank; and Clubley, Michael H., 4,287,098, Cl. 252-463.000.

Coal Industry (Patents) Limited: *See*—
Kormendy, Miltiades, 4,286,771, Cl. 254-108.000.

Coast Catamaran Corporation: *See*—
Alter, Hobart L., 4,286,536, Cl. 114-165.000.

Cobbledick, David S., to General Tire & Rubber Company, The. Polyurethane foams containing brominated diphenyl ether. 4,287,309, Cl. 521-114.000.

Coburn, Robert A.; Evans, Richard T.; Genco, Robert J.; and Batista, Armando, to Research Foundation of State University of New York, The. Novel salicylanilides and microbiocidal compositions and uses thereof. 4,287,191, Cl. 424-230.000.

Coca-Cola Company, The: *See*—
Credle, William S., 4,286,636, Cl. 141-114.000.

Codrino, Giuseppe. Directional signaling mechanism for automotive vehicles. 4,287,397, Cl. 200-61.270.

Coen Company, Inc.: *See*—
Vosper, Ralph R.; Spoormaker, Arie W.; Binasik, Chester S.; and Harthun, Norman E., 4,286,945, Cl. 432-29.000.

Coetzer, Johan, to South African Inventions Development Corporation, The. Electrode for an electrochemical cell, and an electrochemical cell. 4,287,268, Cl. 429-103.000.

Coetzer, Johan; and Thackeray, Michael M., to South African Inventions Development Corporation, The. Electrochemical cell and anode for an electrochemical cell. 4,287,269, Cl. 429-103.000.

Coetzer, Johan; Nolte, Margaretha J.; and de Kocknee Steynberg, Annemare, to South African Inventions Development Corporation, The. Electrolyte for an electrochemical cell, and an electrochemical cell including the electrolyte. 4,287,271, Cl. 429-103.000.

Coggins, Everett W., to Confinement Investors, Inc. Aeration system for solid biological waste. 4,287,060, Cl. 210-194.000.

Coin Controls Limited: *See*—
Wood, Dennis, 4,286,704, Cl. 194-100.00A.

Cojan, Yves: *See*—
Couderc, Georges; Cojan, Yves; and Beck, Jean-Louis, 4,286,760, Cl. 244-3.160.
Couderc, Georges; Cojan, Yves; and Bargues, Denis, 4,287,412, Cl. 250-203.00R.

Cole, H. Ray. Air sock. 4,286,463, Cl. 73-189.000.

Coleman, Charles, to Emerson Electric Co. Minimal energy dissipating detector. 4,287,516, Cl. 340-629.000.

Coles Cranes Limited: *See*—
Atkinson, John, 4,286,720, Cl. 212-178.000.

Collins, Andrew P. Recreational basketball apparatus with moving goal barrier. 4,286,779, Cl. 272-3.000.

Collins, Harold B.: *See*—
Sims, Larry A.; Lambert, Gerald L.; Gross, Raymond J.; and Collins, Harold B., 4,286,406, Cl. 46-72.000.

Combs, C. Marlon, to Dynametric, Inc. Magnetic locking methods and apparatus. 4,287,512, Cl. 340-542.000.

Combustion Engineering, Inc.: *See*—
Anthony, Andrew J., 4,287,426, Cl. 250-506.000.
Penfield, Scott R., Jr., 4,287,022, Cl. 176-3.000.
Robinson, Storm D.; and Rode, Douglas M., 4,286,527, Cl. 110-165.00A.

Cominco Ltd.: *See*—
Kirby, Charles R.; and McKay, Donald R., 4,286,966, Cl. 23-293.00S.

Commercial Management Corporation: *See*—
Gastine, Roland E., 4,286,690, Cl. 182-5.000.

Communications Satellite Corporation: *See*—
Deal, Joseph H., Jr., 4,287,577, Cl. 365-233.000.

Compagnie Generale des Etablissements Michelin: *See*—
Boileau, Jacques, 4,286,645, Cl. 152-360.000.
Chemizard, Andre; and Blanc, Max, 4,286,643, Cl. 152-347.000.

Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme): *See*—
Lazzari, Jean-Pierre, 4,287,544, Cl. 360-131.000.

Compere, Alicia L.; and Griffith, William L., to United States of America, Energy. Microorganism immobilization. 4,287,305, Cl. 435-176.000.

Condon, Richard W.: *See*—
Stewart, Charles; and Condon, Richard W., 4,286,682, Cl. 180-9.24A.

Confinement Investors, Inc.: *See*—
Coggins, Everett W., 4,287,060, Cl. 210-194.000.

Conley, Richard L. Multiple row seed planter with common seed storage. 4,286,530, Cl. 111-1.000.

Connaught Laboratories Limited: *See*—
Wilson, Strathearn, 4,286,637, Cl. 141-374.000.

Connolly, Bruce; and Bradicich, J. Bruce. Apparatus for measuring, cutting and splitting logs. 4,286,638, Cl. 144-3.00K.

Connolly, Walter L. Method of orifice fitting mechanism for pipelines. 4,286,364, Cl. 29-157.10R.

Connor, David T., to Warner-Lambert Company. (2-Oxo-2H-1-benzopyran-3-yl)aminooxoacetic acids and their derivatives. 4,287,126, Cl. 260-343.450.

Connor, David T.: *See*—
Tinney, Francis J.; Connor, David T.; Cetenko, Wiaczeslaw A.; Kerbleski, Joseph J.; and Sorenson, Roderick J., 4,287,340, Cl. 544-250.000.

Conoco, Inc.: *See*—
Convers, Ronald J.; and DeBernardi, James A., 4,286,390, Cl. 34-9.000.
Convers, Ronald J.; Higley, David P.; and DeBernardi, James A., 4,287,089, Cl. 252-414.000.
Doerr, Richard E., 4,286,822, Cl. 299-18.000.

Conrad, Lucas J., to R. J. Reynolds Tobacco Company. Peristaltic valve for transferring material between zones. 4,286,910, Cl. 414-221.000.

Convers, Danielle; Balleys, Francois; and Pfau, Jean, to Ateliers des Charmilles, S.A. Electrode for electrical discharge machining. 4,287,404, Cl. 219-69.00W.

Convers, Ronald J.; and DeBernardi, James A., to Conoco, Inc. Method for removal of water from activated carbon. 4,286,390, Cl. 34-9.000.

Convers, Ronald J.; Higley, David P.; and DeBernardi, James A., to Conoco, Inc. Method for removal of water from activated carbon. 4,287,089, Cl. 252-414.000.

Coombs, Peter A. Fireman's helmet with energy absorbing liner. 4,286,339, Cl. 2-414.000.

Cooper, Frank W., Jr., to Westinghouse Electric Corp. Segmented flexible hone. 4,286,416, Cl. 51-334.000.

Cooper, Herbert. Automobile body with a retractable hard top roof. 4,286,821, Cl. 296-216.000.

Cooper, William T., to Phillips Petroleum Co. Waste heat recovery. 4,287,023, Cl. 201-31.000.

Copal Company Limited: *See*—
Wada, Yasuhiro, 4,287,550, Cl. 361-167.000.

Copyer Company Limited: *See*—
Akita, Yukio; Izumi, Hirotaka; and Asano, Junichi, 4,286,862, Cl. 355-3.0SH.

Coran, Aubert Y.; and Patel, Raman, to Monsanto Company. Compositions of epichlorohydrin rubber and polyester. 4,287,324, Cl. 525-408.000.

Cordier, Jacques: *See*—
Lechevallier, Christian; Cordier, Jacques; and Antoine, Martine, 4,287,045, Cl. 204-243.00R.

Corfield, George C.: *See*—
Ebdon, Leslie C.; Ellis, Andrew T.; and Corfield, George C., 4,287,042, Cl. 204-195.00M.

Corning Glass Works: *See*—
Bailey, Alan C.; and Miller, Stephen B., 4,286,978, Cl. 65-3.00A.
Gulati, Suresh T.; and Spycher, Anton A., 4,287,018, Cl. 156-645.000.

Cornwall, Frank H.; and Ross, William A., to Pitney Bowes Inc. Pressure fusing apparatus for an electrostatic reproducing machine. 4,286,863, Cl. 355-3.0FU.

Corporacion de Fomento de la Produccion: *See*—
Garrett, Donald E.; and Laborde, Martin, 4,287,163, Cl. 423-283.000.

Corporation for Public Broadcasting: *See*—
Kessler, William J., 4,287,602, Cl. 455-286.000.

Corsette, Douglas F., to Diamond International Corporation. Liquid Dispenser. 4,286,736, Cl. 222-321.000.

Corso, Vito, Jr.: *See*—
Demchak, Richard J.; and Corso, Vito, Jr., 4,287,176, Cl. 424-78.000.

Couch, Lana M., to United States of America, National Aeronautics and Space Administration. Wind tunnel supplementary Mach number minimum section insert. 4,286,460, Cl. 73-147.000.

Couderc, Georges; Cojan, Yves; and Beck, Jean-Louis, to Thomson-CSF. Photoelectric direction finder. 4,286,760, Cl. 244-3.160.

Couderc, Georges; Cojan, Yves; and Bargues, Denis, to Thomson-CSF. Photoelectric direction finder. 4,287,412, Cl. 250-203.00R.

Coulter Electronics, Inc.: *See*—
Hogg, Walter R.; and Brunsting, Albert, 4,286,876, Cl. 356-343.000.
Ledis, Stephen L.; Chastain, David L., Jr.; and Crews, Harold R., 4,286,963, Cl. 23-230.00B.

Covert, Stanley R. Retractable mirror. 4,286,840, Cl. 350-289.000.

Cowling, Robert D.: *See*—
Ehretsmann, Jacques; Cowling, Robert D.; Schweizer, Alfred D.; Caldwell, William M.; Boyd, Dennis F.; and Boyd, Robert J., 4,286,604, Cl. 131-359.000.

Craig, Robert J. G., to Incosym, Inc. Universal joint flexure hinge suspension system, and method for manufacturing this system. 4,286,370, Cl. 29-434.000.

Crane, Hewitt D.; and Steele, Carroll M., to SRI International. Double Purkinje eye tracker. 4,287,410, Cl. 250-201.000.

CraneVeyor Corporation: *See*—
Batcheller, Roy W., 4,286,372, Cl. 29-516.000.

Crayton, Frank H.: *See*—
Swain, James W.; and Crayton, Frank H., 4,286,606, Cl. 131-276.000.

Credle, William S., to Coca-Cola Company, The. Dip tube and valve with quick-disconnect coupling for a collapsible container. 4,286,636, Cl. 141-114.000.

Creighton, Gordon R., to Ciba-Geigy Corporation. Heat exchangers. 4,286,365, Cl. 29-157.30V.

Crews, Harold R.: *See*—
Ledis, Stephen L.; Chastain, David L., Jr.; and Crews, Harold R., 4,286,963, Cl. 23-230.00B.

Crow, Harold L.: *See*—
Place, Virgil A.; and Crow, Harold L., 4,286,593, Cl. 128-260.000.

Crumm, John C.: *See*—
Carlsen, George C., II; Crumm, John C.; and Matsuda, Koji, 4,287,477, Cl. 330-255.000.

CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
Melindo, Flavio, 4,287,392, Cl. 179-16.0AA.

Cullen, Walter P.: *See*—
Celmer, Walter D.; Cullen, Walter P.; Huang, Liang H.; Oscarson, John R.; Shibakawa, Riichiro; and Tone, Junsuke, 4,287,182, Cl. 424-118.000.

Culler, Glenn J., to Culler-Harrison Inc. Array processor with parallel operations per instruction. 4,287,566, Cl. 364-754.000.

Culler-Harrison Inc.: *See*—
Culler, Glenn J., 4,287,566, Cl. 364-754.000.

Culmann, Gunter: *See*—
Muller, Rudolf; Klinkner, Hans-Guido; and Culmann, Gunter, 4,286,994, Cl. 106-109.000.

Cunningham, Thomas W. Applicator and tampon. 4,286,594, Cl. 128-263.000.

Curtin, Daniel J., to Atlantic Richfield Company. Disposition of a high nitrogen content oil stream. 4,287,051, Cl. 208-254.00H.

Curtiss-Wright Corporation: *See*—
De Feo, Angelo, 4,287,156, Cl. 422-143.000.

Cushman, Robert H., to Pennwalt Corporation. Panoramic dental radiography image intensification employing minification techniques. 4,287,423, Cl. 250-439.00P.

Cutler, John H.: *See*—
Walker, Loren H.; and Cutler, John H., 4,287,463, Cl. 318-803.000.

D.P.G. Claessens Product-Consultants B.V.: *See*—
Claessens, Dominique F., 4,286,607, Cl. 131-328.000.

Dahlberg, Bengt I.; Ehnstrom, Lars K. J.; and Keim, Carroll R., to Alfa-Laval AB. Production of ethanol. 4,287,303, Cl. 435-162.000.

Dahlstrom, Lars, to ASEA Aktiebolag. Method for generating a pattern by means of an industrial robot and industrial robot for carrying out the method. 4,287,459, Cl. 318-568.000.

Daiberl, Karl. Intra-oral aligning assembly. 4,286,947, Cl. 433-72.000.

Daicel Chemical Industries Ltd.: *See*—
Ishihara, Tetsuo; and Kubo, Keizi, 4,287,297, Cl. 430-435.000.

Daimler-Benz Aktiengesellschaft: *See*—
Scherenberg, Hans O.; Breitschwerdt, Werner; Klein, Wilhelm; and Jahn, Walter, 4,286,359, Cl. 24-230.00R.

D'Alfonso, Nunzio: *See*—
Neitz, Alfred; Pickel, Hans; and D'Alfonso, Nunzio, 4,286,556, Cl. 123-279.000.

Damon, Lloyd E.: *See*—
Gullotti, Damian V.; Damon, Lloyd E.; Chatfield, Phillip A.; and Winter, Joseph, 4,286,744, Cl. 228-125.000.

Daniel Industries, Inc.: *See*—
Tomlin, Jerry B.; and Hodgeman, Herbert H., 4,286,625, Cl. 137-625.430.

Danner, Harold J., Jr. Vacuum bag used in making laminated products. 4,287,015, Cl. 156-382.000.

Darden, Boyd E.; and Hartley, Henry F., to Honeywell Information Systems Inc. Real time adapter unit for use in a data processing system. 4,287,562, Cl. 364-200.000.

Dartmouth College, Trustees of: *See*—
Thomae, Irving H., 4,286,465, Cl. 73-342.000.

Date, Nobuaki: *See*—
Uchidoi, Masanori; Shimizu, Masami; Date, Nobuaki; and Aizawa, Hiroshi, 4,286,849, Cl. 354-23.00D.

Daubach, Ewald: *See*—
Horn, Dieter; Daubach, Ewald; Hahn, Erwin; Uhrig, Herbert; Hoene, Richard; and Naarmann, Herbert, 4,286,959, Cl. 8-524.000.

Daugherty, Thomas L.: *See*—
Sides, Nathan T.; and Daugherty, Thomas L., 4,286,828, Cl. 308-26.000.

David Sensibar Irrevocable Trust: *See*—
Sensibar, Ezra, 4,287,432, Cl. 307-116.000.

Davidson, Boris A.: *See*—
Bashnin, Oleg I.; Semenov, Vasily V.; Fedorov, Vasily N.; Rodionov, Evgeny I.; Davidson, Boris A.; and Schegolev, Gleb S., 4,287,429, Cl. 290-40.00C.

Davidson, Douglas M., Jr. Means and method for connecting large pipe. 4,286,914, Cl. 414-460.000.

Davies, Evan J., to National Research Development Corporation. Electric contact device with fluidized metal particle bed. 4,287,406, Cl. 219-155.000.

Davis, Dallas R., to Davis Explosive Sources, Inc. Linear explosive charge with constant detonation velocity and synchronous booster charges. 4,286,520, Cl. 102-317.000.

Davis Explosive Sources, Inc.: *See*—
Davis, Dallas R., 4,286,520, Cl. 102-317.000.

Davis, Larry: *See*—
Helsley, Grover C.; Dornauer, Horst; and Davis, Larry, 4,287,212, Cl. 424-330.000.

Davis, William J., to Sac Membrane Products Corporation. Alkaline cell with graft polymer separator. 4,287,275, Cl. 429-206.000.

Davy McKee (Oil & Chemicals) Limited: *See*—
Harris, Norman; Dennis, Alan J.; and Harrison, George E., 4,287,127, Cl. 260-346.110.

Harris, Norman; and Shevels, Thomas F., 4,287,369, Cl. 568-454.000.

Harris, Norman; Dennis, Alan J.; and Shevels, Thomas F., 4,287,370, Cl. 568-454.000.

Deacon, Robert H. Traction device for walking on ice. 4,286,396, Cl. 36-62.000.

Deal, Joseph H., Jr., to Communications Satellite Corporation. Interleaved TDMA terrestrial interface buffer. 4,287,577, Cl. 365-233.000.

DeBaryshe, Paul G.; and Glickler, Sheldon L., to Jersey Nuclear-Avco Isotopes, Inc. Compensation of thermal expansion in mirrors for high power radiation beams. 4,287,421, Cl. 250-423.00P.

DeBernardi, James A.: *See—*
Convers, Ronald J.; and DeBernardi, James A., 4,286,390, Cl. 34-9.000.

Convers, Ronald J.; Higley, David P.; and DeBernardi, James A., 4,287,089, Cl. 252-414.000.

DeCaro, Aristide R.; Murphy, Eugene F.; and Maynard, Billy A., to Westinghouse Electric Corp. Method of spray-reflectorizing electric lamp envelopes. 4,287,231, Cl. 427-106.000.

Deep Oil Technology, Inc.: *See—*
Walker, Raymond W., 4,286,665, Cl. 166-339.000.

Deere & Company: *See—*
Hubbard, Arthur L., 4,286,424, Cl. 56-10.200.

De Feo, Angelo, to Curtiss-Wright Corporation. Fluidized bed reactor. 4,287,156, Cl. 422-143.000.

Degesch GmbH: *See—*
Jordy, Angelika; and Kapp, Wolfgang, 4,287,171, Cl. 424-29.000.

Degussa Aktiengesellschaft: *See—*
Fratzer, Gerhard; Beck, Bernhard; Dold, Erwin; and Klebe, Hans, 4,287,097, Cl. 252-462.000.

Kleinschmit, Peter; and Schwarz, Rudolf, 4,286,990, Cl. 106-73.400.

Dehan, Gerard C. H.; and Maulat, Jean-Pierre, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Device for the control by cam of a mobile mechanism. 4,286,473, Cl. 74-107.000.

Deike, Robert F., to Foresight Industries. Mail box support. 4,286,747, Cl. 232-39.000.

Deister Concentrator Co., Inc., The: *See—*
Hollingsworth, Clinton A., 4,287,054, Cl. 209-170.000.

De Kinder, Wilfried L. J.: *See—*
Boute, Raymond T. G.; De Kinder, Wilfried L. J.; Neutjens, Gustaaf W. T.; Pochet, Andre G. G.; Vanderschoot, Jan P. M.; and Van Remortel, Jacques D. A., 4,287,590, Cl. 370-59.000.

Dekker, Lambert: *See—*
Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., 4,287,084, Cl. 252-187.00H.

de Kocknee Steynberg, Annemare: *See—*
Coetzer, Johan; Nolte, Margaretha J.; and de Kocknee Steynberg, Annemare, 4,287,271, Cl. 429-103.000.

Delalande S.A.: *See—*
Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Phillippe L., 4,287,351, Cl. 548-232.000.

Deleenher, Henri: *See—*
Delgleize, Jean; and Deleenher, Henri, 4,286,765, Cl. 248-573.000.

Delgleize, Jean; and Deleenher, Henri, to UOP Inc. Vehicle seats. 4,286,765, Cl. 248-573.000.

Delhaute, Andre: *See—*
Vasseur, Jean-Pierre; Laurent, Michel; Loriau, Jean-Joseph; and Delhaute, Andre, 4,286,743, Cl. 228-124.000.

Delingat, Eckart: *See—*
Schneider, Eckart; and Delingat, Eckart, 4,286,872, Cl. 356-28.000.

Delta-X Corporation: *See—*
Standish, Thomas R., 4,286,925, Cl. 417-12.000.

DeLuca, Raymond F., to Georgia-Pacific Corporation. Sheet material dispenser handwheel and cutting knife. 4,286,489, Cl. 83-335.000.

DeMag Aktiengesellschaft: *See—*
Blum, Wilhelm, 4,286,738, Cl. 222-591.000.

de Maquille, Yannick: *See—*
Pigeon, Marcel; and de Maquille, Yannick, 4,287,288, Cl. 430-169.000.

Demchak, Richard J.; and Corso, Vito, Jr., to American Cyanamid Co. Anthelmintic levamisole and tetramisole gel compositions. 4,287,176, Cl. 424-78.000.

Demchenko, Jury D.: *See—*
Popov, Alexandr D.; Solomin, Vladimir A.; Teptikov, Nikolai R.; and Demchenko, Jury D., 4,287,444, Cl. 310-13.000.

Demers, Robert R., to RCA Corporation. Wafer and boule protection during the blade return stroke of a wafer saw. 4,287,256, Cl. 428-375.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Taniguchi, Yasuo; Ike, Toshiharu; and Nakaya, Hideo, 4,287,311, Cl. 525-58.000.

Dennis, Alan J.: *See—*
Harris, Norman; Dennis, Alan J.; and Harrison, George E., 4,287,127, Cl. 260-346.110.

Harris, Norman; Dennis, Alan J.; and Shevels, Thomas F., 4,287,370, Cl. 568-454.000.

Densmore, Neal W., to Voy Manufacturing Co. System for supporting overhead trolley rail. 4,286,523, Cl. 104-111.000.

Derbyshire, Rodney L., to Radiation Dynamics, Inc. Closure method. 4,287,011, Cl. 156-85.000.

Deshais, Richard; and Carbonnel, Henri, to Novatome. Conduction pump for liquid metal. 4,286,926, Cl. 417-50.000.

Deshaw, Walter R., to Keeler Corporation. Electrically operated remote control rearview mirror. 4,286,841, Cl. 350-289.000.

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Hustedt, Hans, 4,286,936, Cl. 425-119.000.

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Detweiler, Charles A., to Schmelzer Corporation. Control system for turbocharger. 4,286,433, Cl. 60-602.000.

Deutsch, Ralph, to Kawai Musical Instruments Mfg. Co., Ltd. Unified tone generation in a polyphonic tone synthesizer. 4,286,491, Cl. 84-1.010.

Deutsche Forschungs- und Versuchsanstalt fur Luft- und Roumfabert e.V.: *See—*
Lindner, Friedrich, 4,286,650, Cl. 165-1.000.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Panster, Peter; Buder, Wolfgang; and Kleinschmit, Peter, 4,287,094, Cl. 252-431.00R.

Dezvane, Joseph; and Lenac, Vojko. Tool mounting. 4,286,485, Cl. 82-36.00R.

Dhein, Rolf: *See—*
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Diamond International Corporation: *See—*
Corsette, Douglas F., 4,286,736, Cl. 222-321.000.

Diamond Shamrock Corp.: *See—*
Klausmeier, William H.; Johnson, Richard L.; and Hirsch, Arnold L., 4,287,129, Cl. 260-397.100.

Dickie, Ira A., to Champion Road Machinery Limited. Speed reducer. 4,286,480, Cl. 74-785.000.

Dickinson, William W.: *See—*
Hamlin, Robert N.; and Dickinson, William W., 4,286,973, Cl. 55-92.000.

Dickmann, Heinz H.; Hechenberger, Dieter; and Krattner, Richard, to Lingner & Fischer GmbH. Gel or waxy articles. 4,286,890, Cl. 401-19.000.

Dickson, Howard K.: *See—*
Patrick, E. V.; Dickson, Howard K.; and Dunmire, Howard L., 4,286,833, Cl. 316-31.000.

Di Diego, Robert, to Stanley Works, The. Coilable rule casing. 4,286,387, Cl. 33-138.000.

Didier Engineering GmbH: *See—*
Galow, Manfred; and Busbach, Wilhelm, 4,286,912, Cl. 414-287.000.

DiGiacomo, Peter M., to Occidental Research Corporation. Simultaneous extraction of more than one ion by liquid membrane process. 4,287,071, Cl. 210-643.000.

Dills, Raymond L.: *See—*
Hurko, Bohdan; and Dills, Raymond L., 4,286,377, Cl. 29-612.000.

DiMatteo, Paul: *See—*
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Dimiter, Serge. Reconstituted leather and method of manufacture. 4,287,252, Cl. 428-316.000.

Dimitri, Mitchell S.; and Force, Carlton G., to Westvaco Corporation. Tackifying composition for rubber. 4,287,104, Cl. 260-17.500.

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Mickleson, Lee, 4,286,848, Cl. 350-467.000.

Divin, Jury Y.; Polyansky, Oleg J.; and Shulman, Alexandr Y. Method for measuring the spectral distribution of electromagnetic radiation intensity and spectrometer of millimetric and far-infrared ranges for effecting same. 4,287,418, Cl. 250-336.000.

Djordjevic, Ilija; Ritter, Ernst; and Lang, Thomas, to Robert Bosch GmbH. Centrifugal rpm governor for fuel injected internal combustion engines, especially an idling and final rpm governor for diesel vehicle engines. 4,286,558, Cl. 123-368.000.

Dobo, Emerick J., to Monsanto Company. Conjugate filaments and films. 4,287,254, Cl. 428-329.000.

Dodwell, Geoffrey M., to Ciba-Geigy AG. Film base material containing a combination of surfactants. 4,287,298, Cl. 430-533.000.

Doerr, Richard E., to Conoco, Inc. Underspoil slurry haulage. 4,286,822, Cl. 299-18.000.

Dohm, Klaus-Dieter; and Hofmann, Peter, to Chemische Werke Huls A.G. Reacting olefins with ozone in a carboxylic acid medium. 4,287,130, Cl. 260-413.000.

Doi, Kazumasa, to United States of America, Navy. Multi-mode Luneberg lens antenna. 4,287,519, Cl. 343-725.000.

Doi, Yoshiharu: *See—*
Tsutsui, Minoru; and Doi, Yoshiharu, 4,287,036, Cl. 204-157.10R.

Dold, Erwin: *See—*
Fratzer, Gerhard; Beck, Bernhard; Dold, Erwin; and Klebe, Hans, 4,287,097, Cl. 252-462.000.

Dolden, Victor W.: *See—*
Kitzing, Rainer; Ficken, Geoffrey E.; and Dolden, Victor W., 4,287,348, Cl. 548-121.000.

Dombrowsky, Donald S., to Carlisle Corporation. Shielded flat cable. 4,287,385, Cl. 174-36.000.

Donlan, John P.; and Krauss, Alfred R., to Westinghouse Electric Corp. Locking structure for an alignment bushing of a combustion turbine engine. 4,286,921, Cl. 415-136.000.

Dornauer, Horst: *See—*
Helsley, Grover C.; Dornauer, Horst; and Davis, Larry, 4,287,212, Cl. 424-330.000.

Dorpmund, Willi, to Graaff Kommanditgesellschaft. Shipping container construction. 4,286,507, Cl. 98-32.000.

Dorr, Manfred: *See—*
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Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Phillippe L., 4,287,351, Cl. 548-232.000.
Doty, Donald J.: *See*—
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Double Backgammon Enterprises, Inc.: *See*—
Barber, Herbert L., 4,286,787, Cl. 273-248.000.
Double-E Inc.: *See*—
McLean, Douglas K., 4,286,791, Cl. 277-64.000.
Douzon, Colette A.: *See*—
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McMath, Jack A., 4,286,635, Cl. 141-98.000.
Dow Chemical Company, The: *See*—
Hefner, Robert E., Jr.; and Tomalia, Donald A., 4,287,052, Cl. 209-166.000.
Langer, Horst G.; and Brady, Thomas P., 4,287,131, Cl. 260-448.00R.
Legler, Bobby, 4,287,115, Cl. 260-37.0EP.
Tefertiller, Nancy B.; Burdett, Kenneth A.; and Harris, Robert F., 4,287,323, Cl. 525-404.000.
Wing, Phillip L., 4,287,077, Cl. 252-75.000.
Downing, Gerald T., to W. H. Brady Co. Tape dispenser package with core friction ring. 4,286,729, Cl. 221-70.000.
Drab, Ernst: *See*—
Scheurecker, Werner; and Drab, Ernst, 4,286,678, Cl. 177-132.000.
Dragerwerk Aktiengesellschaft: *See*—
Pasternack, Adalbert, 4,286,439, Cl. 62-259.300.
Dren, Anthony T.; and Bopp, Barbara A., to Abbott Laboratories. Antiglaucoma agents. 4,287,192, Cl. 424-248.510.
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Gagliano, Robert L.; and Feuerstein, Herman G., 4,286,902, Cl. 408-79.000.
Dreux, Jacques: *See*—
Simon, Pierre; and Dreux, Jacques, 4,287,206, Cl. 424-279.000.
Drew Chemical Corporation: *See*—
Beecher, Jesse S., 4,287,072, Cl. 210-668.000.
Drieu, Maurice L., to Erin Engineering (Ontario) Ltd. Power saving circuit for gaseous discharge lamps. 4,287,455, Cl. 315-199.000.
Dubell, Edward G.: *See*—
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DuBois, Chester G.: *See*—
Baltz, Gene F.; and DuBois, Chester G., 4,286,553, Cl. 123-187.50R.
Duffield, James R.: *See*—
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Dugrenier, Ernest. Broiler grill cleaning brush. 4,286,349, Cl. 15-111.000.
Dumas, John R.: *See*—
Spinks, Brian M.; and Dumas, John R., 4,287,442, Cl. 307-510.000.
Dumbaugh, George D.; and Wilson, Paul A., to Kinergy Corporation. Sifter stroke screen. 4,287,056, Cl. 209-332.000.
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Patrick, E. V.; Dickson, Howard K.; and Dunmire, Howard L., 4,286,833, Cl. 316-31.000.
Dunn, David C.; and Tweed, George C., Jr., to U.S. Elevator Corporation. Solar heater unit. 4,286,583, Cl. 126-445.000.
Duphar International Research B.V.: *See*—
Van Gilse, Jaap; and Paerels, Gerard B., 4,286,983, Cl. 71-67.000.
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Berghmans, Jacques M. L., 4,287,112, Cl. 260-29.60F.
Holtje, Wilfried G.; Senkler, George H.; and Taggi, Arthur J., 4,286,998, Cl. 106-288.00Q.
Owen, James H., II, 4,287,010, Cl. 149-2.000.
Smiley, Robert A., 4,287,134, Cl. 260-465.100.
Wat, Edward K. W., 4,287,343, Cl. 544-320.000.
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., to Smith Kline & French Laboratories Limited. Pharmacologically active guanidine compounds. 4,287,198, Cl. 424-263.000.
Dussich, George: *See*—
Wartman, Carl E.; and Dussich, George, 4,287,514, Cl. 340-569.000.
Dwyer, Francis G.; and Jenkins, Edwin E., to Mobil Oil Corporation. Zeolite ZSM-39. 4,287,166, Cl. 423-325.000.
Dydyk, Michael, to Motorola Inc. Directional filter for mixers, converters and the like. 4,287,605, Cl. 455-330.000.
Dynametric, Inc.: *See*—
Combs, C. Marlon, 4,287,512, Cl. 340-542.000.
Dynamic Compliance, Incorporated: *See*—
Carlsen, George C., II; Crumm, John C.; and Matsuda, Koji, 4,287,477, Cl. 330-255.000.
Dynamit Nobel Aktiengesellschaft: *See*—
Budich, Wolfgang; and Theissen, Hans, 4,286,716, Cl. 206-577.000.
Dyner, Moises, to Berstein, Marcos. Water filter for radiators. 4,287,067, Cl. 210-487.000.
Dzhamardzhashvili, Vazha A.: *See*—
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Eardley, David B.; and Matick, Richard E., to International Business Machines Corporation. High speed high density, multi-port random access memory cell. 4,287,575, Cl. 365-174.000.
Earhart, Harold W.; and Rugen, Donald F., to Sun Oil Company of Pennsylvania. Sec-ylbiphenyl composition and process for preparing the same. 4,287,074, Cl. 585-6.300.
Easley, Steven J.; and Brartingham, George L., to Texas Instruments Incorporated. Electronic microprocessor system having two cycle branch logic. 4,287,559, Cl. 364-200.000.
Eastman, Alan D.; and Gardner, Lloyd E., to Phillips Petroleum Co. Catalytic hydrodesulfurization of organic compounds employing alumina promoted with zinc titanate, cobalt and molybdenum as the catalytic agent. 4,287,050, Cl. 208-215.000.
Eastman Kodak Company: *See*—
Chapman, Derek D.; and Reczek, James A., 4,287,292, Cl. 430-222.000.
Gysling, Henry J., 4,287,354, Cl. 556-465.000.
Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., 4,287,325, Cl. 525-444.000.
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Mosehauer, Michael W., 4,287,285, Cl. 430-124.000.
O'Connor, Thomas R., 4,287,240, Cl. 427-402.000.
Tersteeg, Glenn E.; and Harold, Richard R., 4,287,155, Cl. 422-64.000.
Eaton, William G.; and Roeder, Allan W., to United States of America, Air Force. Circuit for the adaptive suppression of narrow band interference. 4,287,475, Cl. 328-167.000.
Ebdon, Leslie C.; Ellis, Andrew T.; and Corfield, George C., to National Research Development, Corp. Ion-selective electrode and method of making said electrode. 4,287,042, Cl. 204-195.00M.
Ebert, Hermann; and Bachmann, Gunter, to Triumph Werke Nurnberg A.G. Error correcting typewriter with electronically controlled backspacing to facilitate perfect overstrike of errors. 4,286,889, Cl. 400-697.100.
Eckendorff, Jean-Pierre. Tool assembly for repairing and in particular grinding a tap seat. 4,286,903, Cl. 408-83.500.
Eckert, Werner; and Simon, Wolfgang, to Siemens Aktiengesellschaft. Apparatus for electrodepositing a metallic layer of predetermined thickness. 4,287,043, Cl. 204-228.000.
Eckhardt, Wolfgang; Kunz, Walter; and Hubele, Adolf, to Ciba-Geigy Corporation. Microbicidal meta oxy- and thio-substituted phenylanilines. 4,287,210, Cl. 424-309.000.
Eckle, Otto, to Komet Stahlhalter- und Werkzeugfabrik Robert Breuning GmbH. Clamping device for clamping a turnable cutter blade on a tool holder. 4,286,901, Cl. 407-109.000.
Edgell, James E.: *See*—
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Edwards Engineering Corporation: *See*—
Edwards, Ray C., 4,286,653, Cl. 165-156.000.
Edwards, Ray C., to Edwards Engineering Corporation. Coaxial tube in tube heat exchanger with inner tube support. 4,286,653, Cl. 165-156.000.
Ehmen, Thomas J. Manually operable latching device. 4,286,810, Cl. 292-67.000.
Ehnstrom, Lars K. J.: *See*—
Dahlberg, Bengt I.; Ehnstrom, Lars K. J.; and Keim, Carroll R., 4,287,303, Cl. 435-162.000.
Ehretsmann, Jacques; Cowling, Robert D.; Schweizer, Alfred D.; Caldwell, William M.; Boyd, Dennis F.; and Boyd, Robert J., to Gallaher Limited. Smoking materials. 4,286,604, Cl. 131-359.000.
Ehrig, Volker; Groll, Manfred; and Wunderlich, Klaus, to Bayer Aktiengesellschaft. Phthalocyanine reactive dyestuffs, their preparation and their use for dyeing materials containing hydroxyl groups or amide groups. 4,286,962, Cl. 8-549.000.
Ehrlinger, Friedrich: *See*—
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Eisai Co., Ltd.: *See*—
Tanaka, Satoru; Shimada, Katsutoshi; Hashimoto, Kazunori; Ema, Kiichi; and Udea, Koichiro, 4,287,346, Cl. 546-330.000.
Eisinger, Frantisek L., to Foster Wheeler Energy Corporation. Steam generator support system. 4,286,549, Cl. 122-510.000.
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Babin, Lucien; and Clausse, Daniele, 4,287,076, Cl. 252-70.000.
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Abbott, Bernard J.; and Fukuda, David S., 4,287,120, Cl. 260-112.50R.
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Elliott, Donald O., Jr., to Pfizer, Incorporated. Construction of a CT scanner using heavy ions or protons. 4,287,425, Cl. 250-445.00T.
Ellis, Andrew T.: *See*—
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United States of America, National Aeronautics and Space Administration; and Ellis, Haynes, Jr., 4,287,518, Cl. 343-700.0MS.
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Emerson Electric Co.: *See—*
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Emhart Industries, Inc.: *See—*
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Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,287,198, Cl. 424-263.000.
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Energy Development Associates, Inc.: *See—*
Whittlesey, Curtis C.; and Mashikian, Matthew S., 4,287,267, Cl. 429-49.000.
Enervest, Inc.: *See—*
Kurek, Clarence, 4,286,859, Cl. 354-300.000.
Engdahl, Gerald E.; Nail, James A.; and Allo, Vincent F., to Chicago Bridge & Iron Company. Falling film freeze exchanger. 4,286,436, Cl. 62-123.000.
Engel, Stephen A., to Union Carbide Corporation. Instantaneous scarfing by means of a pilot puddle. 4,287,005, Cl. 148-9.500.
Engelhard, Forest; Kuhn, Rainer; Pump, Wichard; Riess, Reinhard; and Streib, Hugo, to Bayer Aktiengesellschaft. Process for the production of laminate systems from a low density polyethylene coating resin. 4,287,262, Cl. 428-461.000.
Engelhard Minerals & Chemicals Corporation: *See—*
Hoeschele, James D., 4,287,187, Cl. 424-199.000.
Engelkemier, William E.: *See—*
Gipe, Robert C.; and Engelkemier, William E., 4,287,604, Cl. 455-323.000.
Enger, Lars S.: *See—*
Bergman, Ernst L. A.; Blomberg, Peter E.; Enger, Lars S.; Reistad, Bengt R.; and Wallgren, Sonny O., 4,286,569, Cl. 126-85.00B.
Engineered Products, Inc.: *See—*
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Environmental Impact Research Group: *See—*
Steiger, Douglass W.; and Kees, Edward J., 4,286,651, Cl. 165-45.000.
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Erbes-Mrsny, Kathleen A.: *See—*
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Erhardt, Peter F.: *See—*
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Erickson, Donald C. Nitrogen and oxygen via chemical air separation. 4,287,170, Cl. 423-579.000.
Erickson, Kent E., to Keuffel & Esser Company. Photogrammetric measuring system. 4,286,871, Cl. 355-133.000.
Ericsson, Magnus. Method and an apparatus for applying objects to a surface. 4,286,730, Cl. 221-215.000.
Eriksson, Gunnar. Combined sound damper and oil trap for a compressed air apparatus. 4,286,976, Cl. 55-276.000.
Erin Engineering (Ontario) Ltd.: *See—*
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Ernst Leitz Wetzlar GmbH: *See—*
Schneider, Eckart; and Delingat, Eckart, 4,286,872, Cl. 356-28.000.
Esakov, Michael D.; Hudgens, David C., Jr.; and Stringer, Frederick D., to W. R. Grace & Co. Method and apparatus for high speed extrusion of thermoplastic materials. 4,287,151, Cl. 264-560.000.
Esposito, Patsy. Hand truck. 4,286,796, Cl. 280-47.270.
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Le Naour-Sene, Lyliane, 4,286,957, Cl. 8-471.000.
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Lerebourg, Michel, 4,287,144, Cl. 264-79.000.
Etat Francais represente par le Delegue General pour l'Armement: *See—*
Guglielmetti, Robert J.; Garnier, Francis; Poirier, Yves M.; and Petillon, Gisele M. C., 4,287,337, Cl. 544-6.000.
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Eustance, John W.; Hobbs, Stanley Y.; and Carley, Emilie L., to General Electric Company. Textured surface polypropylene film. 4,287,249, Cl. 428-141.000.
Evans, Gerald P. Power operated mechanisms for actuating swinging arms. 4,286,916, Cl. 414-546.000.
Evans, Richard T.: *See—*
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Excelsior Fitness Equipment Co.: *See—*
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Exner, Klaus, to Schloemann-Siemag Aktiengesellschaft. Device for securing the dummy block on the press stem of metal-extrusion presses. 4,286,453, Cl. 72-273.000.
Exxon Production Research Company: *See—*
Pan, Robert B.; and Templeton, John S., III, 4,287,472, Cl. 324-65.00R.
Exxon Research & Engineering Co.: *See—*
French, Hollis E., 4,287,382, Cl. 136-244.000.
Gladrow, Elroy M.; and Winter, William E., 4,287,048, Cl. 208-120.000.
Savage, David W.; Chang, Chin H.; and Longo, John M., 4,286,972, Cl. 55-58.000.
Fabian, Zsolt; Samu, Mihaly; and Balogh, Barnabas, to Mem Muszaki Intezet. Digital humidimeter. 4,287,470, Cl. 324-61.00R.
Fabre, Albert, to Rhone-Poulenc Industries. Fibrous edible proteins having fat particles homogeneously dispersed therethrough. 4,287,219, Cl. 426-276.000.
FAG Kugelfischer Georg Schafer & Co.: *See—*
Kober, Hans, 4,286,467, Cl. 73-460.000.
Fah, Hansjakob; and Grieder, Alfred, to Ciba-Geigy Corporation. Process for producing 2,3,5-trichloropyridine. 4,287,347, Cl. 546-345.000.
Fahim, Magdi M.; Nowak, Victor J.; and Matta, Nagui R., to Bendix Corporation, The. Fuel rail for an engine. 4,286,563, Cl. 123-469.000.
Fahnler, Friedrich: *See—*
Meyer, Rolf-Volker; Dhein, Rolf; and Fahnler, Friedrich, 4,287,315, Cl. 525-183.000.
Fairbanks, Richard E.; Stevenson, James F.; and Blumenfeld, John F., to Emhart Industries, Inc. Electrode assembly for molten glass forehearth. 4,287,380, Cl. 13-6.000.
Fairchild Camera & Instrument Corp.: *See—*
Goodspeed, Steven N., 4,287,433, Cl. 307-473.000.
Faiziev, Tulyagan F.: *See—*
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Falcioni, Joseph G., to Boeing Company, The. Continuous curve countersink and rivet head structure for riveted work pieces. 4,286,371, Cl. 29-509.000.
Farden, Arne S. B. Apparatus with motor-driven peeling device. 4,286,383, Cl. 30-169.000.
Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, to Rhone-Poulenc Industries. Antiviral isoquinoline derivatives. 4,287,197, Cl. 424-258.000.
Farino, Frank G. Weight distributing device for use under an x-ray apron. 4,286,601, Cl. 128-486.000.
Farnworth, Frank; and Clubley, Michael H., to Texaco Limited. Process for the production of exhaust gas filters. 4,287,098, Cl. 252-463.000.
Farooq, Saleem, to Ciba-Geigy Corporation. 1,3-Benzodithiol-2-ones. 4,287,204, Cl. 424-277.000.
Farrar, Jack R.: *See—*
Pachmayr, Frank A.; and Farrar, Jack R., 4,286,401, Cl. 42-71.00P.
Fastritsky, Viktor S.; Fishkin, Pavel S.; and Rybalkin, Evgeny P. Method and apparatus for non-destructive quality testing of spot welds. 4,287,474, Cl. 324-233.000.
Fausel, Thomas E.: *See—*
Pfau, Paul; Fausel, Thomas E.; and Grunder, Arthur, 4,287,537, Cl. 358-299.000.
Fauth, Heinrich; and Koch, Werner, to Hoechst Aktiengesellschaft. Process for manufacturing viscose. 4,287,334, Cl. 536-60.000.
Fava, Ronald A., to Arco Polymers, Inc. Maleimide-styrene copolymer blend with polyurethane. 4,287,314, Cl. 525-130.000.
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Manizza, Guelfo A., 4,286,709, Cl. 206-144.000.
Fedorov, Vasily N.: *See—*
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Felder, Donald W. Composite carrier bar device. 4,286,656, Cl. 166-75.00R.
Fernandez, Leslie U., III. Multiple filament electric lamp. 4,287,452, Cl. 315-65.000.
Ferrari, Giorgio; and Vecchietti, Vittorio, to Simes, S.p.A. Derivatives of phenylethylamines, processes for their preparation and related pharmaceutical compositions. 4,287,211, Cl. 424-322.000.
Feuersanger, Alfred E.; Riseberg, Leslie A.; and McNeill, William H., to GTE Laboratories Incorporated. High pressure discharge lamps with fast restart. 4,287,454, Cl. 315-178.000.
Feuerstein, Herman G.: *See—*
Gagliano, Robert L.; and Feuerstein, Herman G., 4,286,902, Cl. 408-79.000.
Fiat-Allis Construction Machinery, Inc.: *See—*
Boersma, Richard F., 4,286,705, Cl. 198-719.000.
Fiat-Allis Macchine Movimento Terra S.p.A.: *See—*
Grattapaglia, Giorgio, 4,286,695, Cl. 188-196.0BA.
Ficken, Geoffrey E.: *See—*
Kitzing, Rainer; Ficken, Geoffrey E.; and Dolden, Victor W., 4,287,348, Cl. 548-121.000.
Fiedler, Frank, Jr., to Walter Kidde and Company, Inc. Stepped pressure gas valve apparatus. 4,286,768, Cl. 251-130.000.
Fields, Ellis K., to Standard Oil Company (Indiana). Beta-alkyl (or aryl) beta-hydroxyethyl heterocyclic sulfoxides. 4,287,349, Cl. 548-166.000.
Finlayson, Claude M.; and Jordan, John W., to NL Industries, Inc. Viscous organic systems containing an organophilic clay gellant without an organic dispersant therefor. 4,287,086, Cl. 252-316.000.
Fischer, Artur. Sliding contact for a toy vehicle. 4,286,698, Cl. 191-49.000.

Fischer, Eugene C.: *See*—
Castelli, Vincent J.; and Fischer, Eugene C., 4,286,988, Cl. 106-15.050.

Fischer, Rolf: *See*—
Weitz, Hans-Martin; and Fischer, Rolf, 4,287,356, Cl. 560-244.000.

Fishkin, Pavel S.: *See*—
Fastritsky, Viktor S.; Fishkin, Pavel S.; and Rybalkin, Evgeny P., 4,287,474, Cl. 324-233.000.

Fiske, Augustus H., Jr., to Bolt Associates, Inc. Air gun firing sensor apparatus and system. 4,286,687, Cl. 181-120.000.

Fitzmaurice, Richard W.: *See*—
Orlando, Franklin P.; and Fitzmaurice, Richard W., 4,286,426, Cl. 56-330.000.

Fives-Cail Babcock: *See*—
Labriot, Gilbert; Bitsch, Robert; Wattelle, Michel; and Lebesue, Jean, 4,286,944, Cl. 432-14.000.

Fixtures Manufacturing Company: *See*—
Gerner, James L.; and Ramesbothom, Arde, 4,286,891, Cl. 403-7.000.

Flammini, Dominick J. Purse seine ring tie. 4,286,818, Cl. 294-77.000.

Flanders, Dale C., to Massachusetts Institute of Technology. X-ray lithography at ~100 A linewidths using X-ray masks fabricated by shadowing techniques. 4,287,235, Cl. 427-160.000.

Flax, Leonard, to Frame Company, Inc., The. Display and storage rack. 4,286,718, Cl. 211-181.000.

Floyd, Don; Whittle, Lee M.; and Ramey, Richard R. Tagging apparatus for hay baler. 4,286,513, Cl. 100-102.000.

FMC Corporation: *See*—
Braksmayer, Diza P.; and Hussain, Syed N., 4,287,119, Cl. 260-45.95L.
Larsen, Gregory J., 4,287,058, Cl. 210-112.000.
Orlando, Franklin P.; and Fitzmaurice, Richard W., 4,286,426, Cl. 56-330.000.

Foa, Marco: *See*—
Moro, Alessandro; Foa, Marco; and Cassar, Luigi, 4,287,352, Cl. 549-79.000.

Focke & Co.: *See*—
Focke, Heinz, 4,286,712, Cl. 206-264.000.

Focke, Heinz, to Focke & Co. Multi-layered foil cigarette pack including method and apparatus for producing a tear line in the foil. 4,286,712, Cl. 206-264.000.

Fodor, Gabor B.: *See*—
Szent-Gyorgyi, Albert; and Fodor, Gabor B., 4,287,205, Cl. 424-278.000.

Fodor, William G.: *See*—
Jones, John E.; Fodor, William G.; Porter, James R.; and Edgell, James E., 4,286,610, Cl. 132-76.400.

Foley, Peter: *See*—
Schwab, Carl E.; Foley, Peter; and Caputo, Charles A., 4,287,533, Cl. 358-127.000.

Follmeyer, Fred R. Machining fixtures. 4,286,778, Cl. 269-91.000.

Forbes, Brian K.; and Catiller, Robert D., to Burroughs Corporation. Dual mode microprocessor system. 4,287,560, Cl. 364-200.000.

Force, Carlton G.: *See*—
Dimitri, Mitchell S.; and Force, Carlton G., 4,287,104, Cl. 260-17.500.

Ford Motor Company: *See*—
Samanta, Shyam K., 4,286,905, Cl. 409-132.000.

Foresight Industries: *See*—
Deike, Robert F., 4,286,747, Cl. 232-39.000.

Forgo, Imre; Zahir, Abdul-Cader; and Francois, Jacques, to Ciba-Geigy Corporation. Adhesive or adhesive component containing chlorosulfonated amide or imide. 4,287,106, Cl. 260-28.50B.

Forsyth, Clark H.; Van Hooydonk, Anton H. G.; and Ralph, Harold D., to International Harvester Company. Rearwardly folding agricultural implement with extendable transport wheels. 4,286,672, Cl. 172-311.000.

Foseco Trading A.G.: *See*—
Kristiansen, Jan O.; and McCray, Walter A., 4,286,773, Cl. 266-44.000.

Foster, Howard: *See*—
Goslin, John K.; Bugler, John H.; and Foster, Howard, 4,286,605, Cl. 131-358.000.

Foster Wheeler Energy Corporation: *See*—
Eisinger, Frantisek L., 4,286,549, Cl. 122-510.000.
Guido, Paul V., 4,287,430, Cl. 290-40.00C.

Foster Wheeler Limited: *See*—
Ruhe, Anthony; and Nickerson, James H. D., 4,286,654, Cl. 165-172.000.

Fouss, James L.; and Parker, John J., to Hancor, Inc. Snap-in tee connector. 4,286,808, Cl. 285-158.000.

Fowler, Thomas P., to Research Products Corp. Humidifier control. 4,286,751, Cl. 236-44.00R.

Frame Company, Inc., The: *See*—
Flax, Leonard, 4,286,718, Cl. 211-181.000.

France Bed Co., Ltd.: *See*—
Ikeda, Minoru, 4,286,344, Cl. 5-424.000.

Francis, Hubert C.: *See*—
Green, George W.; and Francis, Hubert C., 4,287,103, Cl. 260-17.00R.

Francois, Jacques: *See*—
Forgo, Imre; Zahir, Abdul-Cader; and Francois, Jacques, 4,287,106, Cl. 260-28.50B.

Franke, Rudolf. Multi-plate friction clutch. 4,286,686, Cl. 180-233.000.

Franks, Lawrence A., to Burr Oak Tool & Gauge Company. Fin collection and transport apparatus. 4,286,486, Cl. 83-23.000.

Fratzer, Gerhard; Beck, Bernhard; Dold, Erwin; and Klebe, Hans, to Degussa Aktiengesellschaft. Carrier matrix for catalysts and a process for the production of same. 4,287,097, Cl. 252-462.000.

Fraze, Ermal C.; and Brown, Omar L., to Fraze, Ermal C. Tab and ecology end. 4,286,728, Cl. 220-270.000.

French, Hollis E., to Exxon Research & Engineering Co. Solar cell assembly and fabrication of solar cell panels utilizing same. 4,287,382, Cl. 136-244.000.

Friedericy, Johan A.; and Towgood, Dennis A., to Garrett Corporation, The. Composite material flywheel hub. 4,286,475, Cl. 74-572.000.

Fritchle, Elena C.: *See*—
Pieslak, George; Erbes-Mrsny, Kathleen A.; and Fritchle, Elena C., 4,287,034, Cl. 204-147.000.

Frito-Lay, Inc.: *See*—
Pappas, Clifford J.; and Vickers, Albert F., 4,287,220, Cl. 426-623.000.

Fritzsche Dodge & Olcott Inc.: *See*—
Kulka, Kurt; Zazula, Teodosij; and Yurecko, John M., Jr., 4,287,100, Cl. 252-522.00R.

Frodsham, Colin: *See*—
Ibbotson, Peter; Smith, John C.; and Frodsham, Colin, 4,287,274, Cl. 429-156.000.

Frolov, Alexei V.: *See*—
Belsky, Arkady A.; Eljutin, Alexandr V.; Zubkov, Valery N.; Konjukov, Alexandr I.; Krasinskaya, Lidia I.; Nekrasova, Elena A.; Nizharadze, Konstantin S.; Markova, Larisa F.; Mirskaya, Mirra G.; Frolov, Alexei V.; and Judin, Evgeny A., 4,287,030, Cl. 204-105.00R.

FSI Corporation: *See*—
Blackwood, Robert S., 4,286,541, Cl. 118-52.000.

Fuchs, Rainer; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Combating arthropods with stereoisomers of 2,2-dimethyl-3-(2,2-dichlorovinyl)-cyclopropane-1-carboxylic acid α-cyano-3-phenoxy-4-fluoro-benzyl ester. 4,287,208, Cl. 424-304.000.

Fuhrhop, Marious P. Multi-purpose exercise enhancing device. 4,286,782, Cl. 272-117.000.

Fuji Photo Film Co., Ltd.: *See*—
Kogane, Mikio; and Yamazaki, Seiichi, 4,286,869, Cl. 355-75.000.

Fuji Seal Industry Co., Ltd.: *See*—
Fujio, Masaaki, 4,286,421, Cl. 53-399.000.

Fujii, Tadashiro: *See*—
Kotani, Kikuo; Ohyama, Kunio; Nakagawa, Nobuaki; Fujii, Tadashiro; and Watanabe, Susumu, 4,287,345, Cl. 546-261.000.

Fujimoto Photo Industrial Co., Ltd.: *See*—
Kashiwagi, Atumi, 4,286,867, Cl. 355-67.000.

Fujio, Masaaki, to Fuji Seal Industry Co., Ltd. Method and machine for fitting a sleeve seal of a collapsed form over a container. 4,286,421, Cl. 53-399.000.

Fujita, Takeshi: *See*—
Kawamatsu, Yutaka; and Fujita, Takeshi, 4,287,200, Cl. 424-270.000.

Fujitsu Fanuc Limited: *See*—
Nozawa, Ryoichiro; Amemiya, Yoichi; Kawamata, Mitsuo; Isohata, Shigeru; Sasaki, Takao; and Takekoshi, Yoshitaka, 4,287,460, Cl. 318-571.000.

Fujitsu Limited: *See*—
Fukushima, Toshitaka, 4,287,569, Cl. 365-96.000.

Fujiu, Takahiro; Nakajima, Masao; and Okano, Shigeru, to Toppan Printing Co., Ltd. Method of dyeing cellulose fiber-containing structures. 4,286,958, Cl. 8-471.000.

Fujiwara, Shinobu; Furukawa, Kiyoshi; Kikuchi, Nobuaki; Iizawa, Osamu; Tanaka, Hitoshi; and Ueoka, Hisayoshi, to TDK Electronics Co., Ltd. High dielectric constant type ceramic composition consisting essentially of $Pb(Fe_{1/2}Nb_{1/2})O_3$-$Pb(Mg_{1/3}Nb_{2/3})O_3$-$Pb(Mg_{1/2}W_{1/2})O_3$. 4,287,075, Cl. 106-39.500.

Fujmura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, to Taiho Pharmaceutical Company, Limited. Pharmaceutical composition containing 1,3,5-substituted biuret compound. 4,287,207, Cl. 424-282.000.

Fukano, Kazuaki: *See*—
Nishio, Hiroshi; Fukano, Kazuaki; Amano, Isao; and Okumura, Osamu, 4,287,101, Cl. 252-537.000.

Fukaya, Hirokazu; and Shoji, Masashi, to Nippon Electric Co., Ltd. Power amplifier apparatus having over-current protection function. 4,287,390, Cl. 179-1.00A.

Fukaya, Yasuhiro: *See*—
Ohmae, Takashi; Fukaya, Yasuhiro; Yoshida, Yasuyuki; Oka, Tamotu; Sato, Masahiko; and Nagareda, Masazumi, 4,287,405, Cl. 219-136.000.

Fukuda, David S.: *See*—
Abbott, Bernard J.; and Fukuda, David S., 4,287,120, Cl. 260-112.50R.
Abbott, Bernard J.; and Fukuda, David S., 4,287,302, Cl. 435-119.000.

Fukuda, Takeshi: *See*—
Itoh, Kunio; Fukuda, Takeshi; and Matumura, Masaaki, 4,287,114, Cl. 260-37.0SB.

Fukunaga, Osamu: *See*—
Endo, Tadashi; Fukunaga, Osamu; and Iwata, Minoru, 4,287,164, Cl. 423-290.000.

Fukuoka, Kazuaki, to Norton Simon, Inc. Container for beverages and the like. 4,286,745, Cl. 229-4.500.

Fukushima, Toshitaka, to Fujitsu Limited. Semiconductor memory device. 4,287,569, Cl. 365-96.000.
Fule, Stefan. Machine of the axial piston pump type which can be used as a pump or as a motor. 4,286,503, Cl. 91-507.000.
Funahashi, Masao; and Maeda, Shigeru, to Matsushita Electric Industrial Co., Ltd.; and Kyokuto Electric Co., Ltd. Card or book involving luminescence. 4,286,399, Cl. 40-124.100.
Furman, Anthony H.: *See*—
Cankurt, Nurettin T.; and Furman, Anthony H., 4,286,970, Cl. 48-87.000.
Furukawa, Kiyoshi: *See*—
Fujiwara, Shinobu; Furukawa, Kiyoshi; Kikuchi, Nobuaki; Iizawa, Osamu; Tanaka, Hitoshi; and Ueoka, Hisayoshi, 4,287,075, Cl. 106-39.500.
Furukawa, Yuuichiro: *See*—
Tezuka, Hideharu; and Furukawa, Yuuichiro, 4,287,436, Cl. 307-270.000.
Fusco, Andrew. Tire mounting guides. 4,286,369, Cl. 29-273.000.
Futaba Denshi Kogyo K.K.: *See*—
Takagi, Toshinori; Morimoto, Kiyoshi; and Watanabe, Hiroshi, 4,286,545, Cl. 118-723.000.
Fuzioka, Keizi; and Shinomiya, Masami, to Ohtsu Tire & Rubber Co., Ltd., The. Apparatus for producing pneumatic tires. 4,286,942, Cl. 425-577.000.
G.D. Societa per Azioni: *See*—
Alamaro, Moshe, 4,287,040, Cl. 204-179.000.
G. S. Blakeslee & Co.: *See*—
Vilen, Erik O., 4,286,920, Cl. 415-121.00G.
Gadd, John H.: *See*—
Mower, Peter; and Gadd, John H., 4,286,351, Cl. 15-250.420.
Gaddy, Thomas W., to General Electric Company. Tuning arrangement for electrical components. 4,287,498, Cl. 334-74.000.
GAF Corporation: *See*—
Burwasser, Herman, 4,287,286, Cl. 430-127.000.
Woodring, William J.; and Gulino, James A., 4,287,263, Cl. 428-489.000.
Gagliano, Robert L.; and Feuerstein, Herman G., to Dresser Industries, Inc. Self-colleting drill. 4,286,902, Cl. 408-79.000.
Gajewski, Henry M.; Grode, Gerald A.; Measells, Paul E.; and Miripol, Jeffrey E., to Baxter Travenol Laboratories, Inc. Blood compatible polymers and medical devices made therefrom containing dioctyladipate plasticizer. 4,286,597, Cl. 128-272.000.
Gaku, Morio; Nagai, Norio; and Osaki, Yasunari, to Mitsubishi Gas Chemical Company, Inc. Novel crosslinkable resin composition and method for producing a laminate using said composition. 4,287,014, Cl. 156-306.900.
Gale, Anthony G., to Rolls-Royce Limited. Rotor blade or stator vane for a gas turbine engine. 4,286,924, Cl. 416-97.00R.
Gale, Richard W.: *See*—
Smith, Francis H.; and Gale, Richard W., 4,286,874, Cl. 356-338.000.
Galer, Richard E.; and Webb, Paul C., to United States Gypsum Company. Very high early strength cement. 4,286,991, Cl. 106-90.000.
Galer, Richard E.; and Webb, Paul C., to United States Gypsum Company. Very high early strength cement. 4,286,992, Cl. 106-90.000.
Gallaher Limited: *See*—
Ehretsmann, Jacques; Cowling, Robert D.; Schweizer, Alfred D.; Caldwell, William M.; Boyd, Dennis F.; and Boyd, Robert J., 4,286,604, Cl. 131-359.000.
Gallant, Edward. Fertilizer dispenser with one-handed actuation. 4,286,737, Cl. 222-470.000.
Galow, Manfred; and Busbach, Wilhelm, to Didier Engineering GmbH. Process and apparatus for charging and sealing a charging port of a chamber. 4,286,912, Cl. 414-287.000.
Galves, Jean-Pierre; and Gutierrez, Jean-Marie, to Thomson-CSF. Process for producing a scintillator screen. 4,287,230, Cl. 427-65.000.
Gamble, George W. High-fidelity speaker system. 4,287,389, Cl. 179-1.00F.
Ganellin, Charon R.: *See*—
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,287,198, Cl. 424-263.000.
Garden Way Incorporated: *See*—
Ackerman, Donald W., 4,286,670, Cl. 172-42.000.
Gardner, Lloyd E.: *See*—
Eastman, Alan D.; and Gardner, Lloyd E., 4,287,050, Cl. 208-215.000.
Garkisch, Otto-Ludwig: *See*—
Moller, Friedrich-Wilhelm; Buchold, Henning; Klein, Helmut; Garkisch, Otto-Ludwig; Gutlhuber, Friedrich; and Laber, Walter, 4,287,375, Cl. 585-440.000.
Garman, John A.; Mamuzic, Rastko I.; McDonald, Robert B.; Sands, John L.; and Thompson, Gregory, to Great Lakes Chemical Corporation. Perbromination of phenol and diphenyl ether at elevated temperature using bromine as the reaction medium. 4,287,373, Cl. 568-639.000.
Garnier, Francis: *See*—
Guglielmetti, Robert J.; Garnier, Francis; Poirier, Yves M.; and Petillon, Gisele M. C., 4,287,337, Cl. 544-6.000.
Garrett Corporation, The: *See*—
Friedericy, Johan A.; and Towgood, Dennis A., 4,286,475, Cl. 74-572.000.
Garrett, Donald E.; and Laborde, Martin, to Saline Processors, Inc.; and Corporacion de Fomento de la Produccion. Process for recovering lithium from brine by salting out lithium sulfate monohydrate. 4,287,163, Cl. 423-283.000.
Gastine, Roland E., to Commercial Management Corporation. Escape device. 4,286,690, Cl. 182-5.000.
Gates, Timothy P., to Jordan College. Solar heat system. 4,286,575, Cl. 126-422.000.
Gatzki, Helmut H., to Index-Werke KG Hahn & Tessky. Machine tool. 4,286,484, Cl. 82-32.000.
Gavrilov, Anatoly N.: *See*—
Godin, Eduard M.; Anoshko, Vladimir A.; Gavrilov, Anatoly N.; Akhmerov, Almas F.; Zverkov, Garik E.; Semenov, Valentin P.; Grachev, Vladimir V.; Chepurin, Valentin M.; Mikhailov, Viktor Y.; and Rybnikov, Sergei I., 4,286,450, Cl. 72-59.000.
Gay, Michael J.; and Gutmann, Johannes A., to Motorola Inc. Demodulator system including a tunable discriminator suitable for use in a secam television receiver. 4,287,530, Cl. 358-23.000.
Gazda, Imre I., to Otis Engineering Corporation. Equalizing valve for use in a well tool string. 4,286,661, Cl. 166-316.000.
Gebetsberger, Wilhelm: *See*—
Wagner, Fritz; Rapp, Peter; Bock, Hans; Lindorfer, Walter; Schulz, Walther; and Gebetsberger, Wilhelm, 4,286,660, Cl. 166-246.000.
Geiser, Edward M.; and Johnson, Russell W., to UOP Inc. Purification of chlorophenolic derived compounds. 4,287,038, Cl. 204-158.00R.
Geisinger, Wolfgang. Apparatus for inserting a resilient band on a container. 4,286,367, Cl. 29-235.000.
Gellert, Jobst U. Injection molding nozzle seal. 4,286,941, Cl. 425-566.000.
Genco, Robert J.: *See*—
Coburn, Robert A.; Evans, Richard T.; Genco, Robert J.; and Batista, Armando, 4,287,191, Cl. 424-230.000.
Gendron, Aime J., to Hercules Incorporated. Method and apparatus for injection blow molding an article with improved detail definition. 4,286,940, Cl. 425-533.000.
Gendron, Aime J., to Hercules Incorporated. Method and apparatus for injection blow molding an article with improved detail definition. 4,287,150, Cl. 264-538.000.
General Dynamics, Pomona Division: *See*—
Block, Kenneth A.; Carter, William M.; and Schillreff, George H., 4,286,498, Cl. 86-1.00R.
General Electric Company: *See*—
Bluestein, Ben A., 4,287,353, Cl. 556-459.000.
Borland, Walter G., 4,287,556, Cl. 363-41.000.
Bradley, Irving, 4,287,448, Cl. 313-113.000.
Brehse, Robert F., 4,287,557, Cl. 363-95.000.
Cankurt, Nurettin T.; and Furman, Anthony H., 4,286,970, Cl. 48-87.000.
Eustance, John W.; Hobbs, Stanley Y.; and Carley, Emilie L., 4,287,249, Cl. 428-141.000.
Gaddy, Thomas W., 4,287,498, Cl. 334-74.000.
Gerry, Otto F., 4,286,391, Cl. 34-44.000.
Hurko, Bohdan; and Dills, Raymond L., 4,286,377, Cl. 29-612.000.
Komandure, Rangachary, 4,286,568, Cl. 125-11.00R.
Olander, Walter K., 4,287,321, Cl. 525-392.000.
Pinkham, Clinton L., 4,287,489, Cl. 331-117.00R.
Walker, Loren H.; and Cutler, John H., 4,287,463, Cl. 318-803.000.
Webster, Harold F., 4,287,572, Cl. 365-128.000.
Wentorf, Robert H., Jr.; and Rocco, William A., 4,287,168, Cl. 423-446.000.
General Motors Corporation: *See*—
Hammar, Richard H.; and Harvey, Douglas J., 4,286,362, Cl. 29-2.000.
Klomp, Edward D., 4,286,557, Cl. 123-298.000.
McArthur, Donald N.; and Heintz, Robert A., 4,286,954, Cl. 493-244.000.
Micheli, Adolph L., 4,286,378, Cl. 29-621.000.
Stoltman, Donald D., 4,286,562, Cl. 123-454.000.
General Signal Corporation: *See*—
Schwab, Carl E.; Foley, Peter; and Caputo, Charles A., 4,287,533, Cl. 358-127.000.
General Tire & Rubber Company, The: *See*—
Cobbledick, David S., 4,287,309, Cl. 521-114.000.
Georg Fischer Brugg-Oehler AG: *See*—
Bernath, Oskar, 4,286,540, Cl. 118-50.000.
Geo. A. Hormel & Company: *See*—
Hahn, Douglas D.; Epley, Dennis E.; and Granle, Kenneth I., 4,286,599, Cl. 128-316.000.
Geo. P. Reintjes Co., Inc.: *See*—
Musser, John J., 4,286,529, Cl. 110-340.000.
Georgia-Pacific Corporation: *See*—
DeLuca, Raymond F., 4,286,489, Cl. 83-335.000.
Green, George W.; and Francis, Hubert C., 4,287,103, Cl. 260-17.00R.
Geosource Inc.: *See*—
Glahn, Robert J., 4,286,621, Cl. 137-514.000.
Gerlach, C. Richard: *See*—
Heath, Rodney T.; and Gerlach, C. Richard, 4,286,929, Cl. 417-404.000.
Gerner, James L.; and Ramesbothom, Arde, to Fixtures Manufacturing Company. Connector for an elongate member in frame structures. 4,286,891, Cl. 403-7.000.
Gerry, Otto F., to General Electric Company. Control system for an automatic clothes dryer. 4,286,391, Cl. 34-44.000.
Gershon Meckler Associates, P.C.: *See*—
Westenhofer, Donald G.; and Meckler, Gershon, 4,286,667, Cl. 169-16.000.

Gesellschaft fur Biotechnologische Forschung GmbH: *See*—
Wagner, Fritz; Rapp, Peter; Bock, Hans; Lindorfer, Walter; Schulz, Walther; and Gebetsberger, Wilhelm, 4,286,660, Cl. 166-246.000.

Gessner, Wolfgang; Kuhn, Helmut; and Plotz, Kurt, to Hoechst Aktiengesellschaft. Bituminized roof sheet. 4,287,248, Cl. 428-137.000.

Gewerkschaft Eisenhutte Westfalia: *See*—
Merten, Gerhard; Peters, Wolfgang; Schneider, Hans-Dieter; and Heyer, Willy, 4,286,823, Cl. 299-43.000.

Gibbons, Ian; Rowley, Gerald L.; and Ullman, Edwin F., to Syva Company. Charge effects in enzyme immunoassays. 4,287,300, Cl. 435-5.000.

Gilbert, Marie, to Ato Chimie. Process for making alpha-olefin polymers or copolymers with high isotacticity index. 4,287,093, Cl. 252-429.00B.

Gildemeister AG: *See*—
Henneberg, Hasso; Hesse, Werner; and Junike, Wilhelm, 4,286,483, Cl. 82-2.00R.

Gillum, Richard R. Cross axis shell feeding apparatus for firearms. 4,286,499, Cl. 89-33.00B.

Gilson, Alan P.: *See*—
Siryj, Bohdan W.; and Gilson, Alan P., 4,286,790, Cl. 369-36.000.

Gipe, Robert C.; and Engelkemier, William E., to United States of America, Navy. RF and IF Circuitry of an uplink receiver. 4,287,604, Cl. 455-323.000.

Gipson, Robert M.: *See*—
Marquis, Edward T.; Gipson, Robert M.; and Watts, Lewis W., Jr., 4,287,364, Cl. 564-332.000.

Gladrow, Elroy M.; and Winter, William E., to Exxon Research & Engineering Co. Cracking process with catalyst of combined zeolites. 4,287,048, Cl. 208-120.000.

Glahn, Robert J., to Geosource Inc. Dual acting check valve dampener. 4,286,621, Cl. 137-514.000.

Glickler, Sheldon L.: *See*—
DeBaryshe, Paul G.; and Glickler, Sheldon L., 4,287,421, Cl. 250-423.00P.

Gloaguen, Gilbert Y. M., to U.S. Philips Corporation. Constant-voltage generator for integrated circuits. 4,287,467, Cl. 323-314.000.

Global Coatings Limited: *See*—
Kaufmann, John H., 4,287,241, Cl. 427-403.000.

Gloucester Engineering Co., Inc.: *See*—
Houle, Philip J.; and Oliver, Robert G., 4,286,907, Cl. 414-72.000.

Godard, Pierre; and Billot, Michel, to Saft-Societe des Accumulateurs Fixes et de Traction. Apparatus for regulating the charging of a storage battery. 4,287,465, Cl. 320-56.000.

Godin, Eduard M.; Anoshko, Vladimir A.; Gavrilov, Anatoly N.; Akhmerov, Almas F.; Zverkov, Garik E.; Semenov, Valentin P.; Grachev, Vladimir V.; Chepurin, Valentin M.; Mikhailov, Viktor Y.; and Rybnikov, Sergei I. Apparatus for manufacturing corrugated tubes. 4,286,450, Cl. 72-59.000.

Godwin, Richard H. Child-proof cabinet closures. 4,286,809, Cl. 292-54.000.

Goetze AG: *See*—
Beyer, Horst, 4,286,646, Cl. 164-57.100.

Golden, Gerald S.; Lemkey, Franklin D.; and Brooks, Clyde S., to United Technologies Corporation. Process for producing supported skeletal catalytic materials. 4,287,096, Cl. 252-455.00R.

Goller, Glen J.; and Salonia, Joseph R., to United Technologies Corporation. Dry floc method for making an electrochemical cell electrode. 4,287,232, Cl. 427-113.000.

Goncharoff, Nikolai; and Puntil, Dennis M., to Motorola, Inc. Multichannel communication device with manual and automatic scanning electronic channel selection. 4,287,599, Cl. 455-77.000.

Gonmori, Makoto: *See*—
Nonaka, Kohei; Koyama, Masahiro; Gonmori, Makoto; Kimura, Takeo; and Shiga, Tetsuo, 4,287,295, Cl. 430-349.000.

Good, Dallis L.: *See*—
Good, David L.; and Good, Dallis L., 4,287,031, Cl. 204-109.000.

Good, David L.; and Good, Dallis L. Portable electrolysis unit for recovery of precious metals. 4,287,031, Cl. 204-109.000.

Goodhouse, Carl J.: *See*—
Strachan, Robert; and Goodhouse, Carl J., 4,287,583, Cl. 368-10.000.

Goodman, David S.; Selvin, Gerald J.; Dubell, Edward G.; Doty, Donald J.; Erbe, Alfred R.; and Wilson, Robert E., to International Telephone and Telegraph Corporation. Interconnection system. 4,286,834, Cl. 339-16.00R.

Goodspeed, Steven N., to Fairchild Camera & Instrument Corp. Transistor logic tristate output with reduced power dissipation. 4,287,433, Cl. 307-473.000.

Goodyear Aerospace Corporation: *See*—
Wiseman, Roy R., Jr.; and Kovac, James J., 4,286,694, Cl. 188-71.500.

Gore, Donald B.: *See*—
Rosler, Robert K.; Gore, Donald B.; Riddell, Malcolm N.; and Hunt, Earl R., 4,287,105, Cl. 260-18.0EP.

Gori & Zucchi S.p.A.: *See*—
Beucci, Marcello, 4,287,411, Cl. 250-203.00R.

Gorshe, Thomas M., to American Can Company. Flexible pouch. 4,286,746, Cl. 229-55.000.

Gorss, Jeffrey B.: *See*—
Van Linden, Jan H. L.; and Gorss, Jeffrey B., 4,286,985, Cl. 75-65.00R.

Gort, Meinrad, to Weber, Rudolf, a part interest. Recovery of solvent residues from textiles. 4,286,394, Cl. 34-76.000.

Goshima, Yoshio; and Osada, Hisashi, to TDK Electronics Co., Ltd. Concentrated constant type delay device. 4,287,492, Cl. 333-140.000.

Goslin, John K.; Bugler, John H.; and Foster, Howard, to Imperial Group Limited. Treating sheet material for making cigar wrappers. 4,286,605, Cl. 131-358.000.

Gottlieb Commercial Company A/S: *See*—
Nielsen, Willi G., 4,287,243, Cl. 428-17.000.

Graaff Kommanditgesellschaft: *See*—
Dorpmund, Willi, 4,286,507, Cl. 98-32.000.

Grachev, Vladimir V.: *See*—
Godin, Eduard M.; Anoshko, Vladimir A.; Gavrilov, Anatoly N.; Akhmerov, Almas F.; Zverkov, Garik E.; Semenov, Valentin P.; Grachev, Vladimir V.; Chepurin, Valentin M.; Mikhailov, Viktor Y.; and Rybnikov, Sergei I., 4,286,450, Cl. 72-59.000.

Graf, Ronald E. Vortex chamber controlling combined entrance exit. 4,286,627, Cl. 137-810.000.

Granle, Kenneth I.: *See*—
Hahn, Douglas D.; Epley, Dennis E.; and Granle, Kenneth I., 4,286,599, Cl. 128-316.000.

Grattapaglia, Giorgio, to Fiat-Allis Macchine Movimento Terra S.p.A. Device for automatically adjusting brake clearance, in particular for an earth moving machine. 4,286,695, Cl. 188-196.0BA.

Grau, Werner: *See*—
Kneller, Eckhart; Koenig, Roland; Koester, Eberhard; Grau, Werner; and Mayer, Dieter, 4,287,225, Cl. 427-48.000.

Great Lakes Chemical Corporation: *See*—
Garman, John A.; Mamuzic, Rastko I.; McDonald, Robert B.; Sands, John L.; and Thompson, Gregory, 4,287,373, Cl. 568-639.000.

Green, George W.; and Francis, Hubert C., to Georgia-Pacific Corporation. Joint composition including starch. 4,287,103, Cl. 260-17.00R.

Green Line, Inc.: *See*—
Wedman, Thomas W., 4,286,892, Cl. 403-262.000.

Greenwald Electro-Mechanical Consultants, Inc.: *See*—
Greenwald, Harry, 4,287,396, Cl. 200-35.00R.

Greenwald, Harry, to Greenwald Electro-Mechanical Consultants, Inc. Control device for a coin operated mechanism. 4,287,396, Cl. 200-35.00R.

Greer, Raymond T.; Vale, Bradley H.; and Knoll, Randall L., to Iowa State University Research Foundation, Inc. Vascular prosthesis and method of making the same. 4,286,341, Cl. 3-1.400.

Greutert, Albert; and Stumvoll, Ernst, to Elfo AG Sachseln. Sieve having substantially plane sieve sheets and a method for its manufacture. 4,287,066, Cl. 210-464.000.

Grieder, Alfred: *See*—
Fah, Hansjakob; and Grieder, Alfred, 4,287,347, Cl. 546-345.000.

Griffith, William L.: *See*—
Compere, Alicia L.; and Griffith, William L., 4,287,305, Cl. 435-176.000.

Grigo, Ulrich; Morbitzer, Leo; Arlt, Klaus-Peter; Binsack, Rudolf; and Merten, Josef, to Bayer Aktiengesellschaft. Mixtures of polypropylene and liquid saturated diorganopolysiloxanes. 4,287,108, Cl. 260-29.1SB.

Grode, Gerald A.: *See*—
Gajewski, Henry M.; Grode, Gerald A.; Measells, Paul E.; and Miripol, Jeffrey E., 4,286,597, Cl. 128-272.000.

Groll, Manfred: *See*—
Ehrig, Volker; Groll, Manfred; and Wunderlich, Klaus, 4,286,962, Cl. 8-549.000.

Gross, Harald, to J. M. Voith GmbH. Overload protection device for a propeller drive engine. 4,286,923, Cl. 416-43.000.

Gross, Raymond J.: *See*—
Sims, Larry A.; Lambert, Gerald L.; Gross, Raymond J.; and Collins, Harold B., 4,286,406, Cl. 46-72.000.

Grudich, Nicholas. Hand propelled yard machinery hang-lock device. 4,286,444, Cl. 70-13.000.

Grumman Aerospace Corp.: *See*—
Myles, James M., 4,287,266, Cl. 428-596.000.

Grunder, Arthur: *See*—
Pfau, Paul; Fausel, Thomas E.; and Grunder, Arthur, 4,287,537, Cl. 358-299.000.

GTE Laboratories Incorporated: *See*—
Feuersanger, Alfred E.; Riseberg, Leslie A.; and McNeill, William H., 4,287,454, Cl. 315-178.000.
Natansohn, Samuel; and Su, Sophia R., 4,287,159, Cl. 423-54.000.

GTE Products Corporation: *See*—
Christini, James N., 4,286,946, Cl. 432-112.000.

Guerret, Patrick G.: *See*—
Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Phillippe L., 4,287,351, Cl. 548-232.000.

Guex and Fils S.A.: *See*—
Guex, Raymond, 4,286,677, Cl. 175-395.000.

Guex, Raymond, to Guex and Fils S.A. Helical impact bit for drilling stone with narrow guide lips. 4,286,677, Cl. 175-395.000.

Guglielmetti, Robert J.; Garnier, Francis; Poirier, Yves M.; and Petillon, Gisele M. C., to Etat Francais represente par le Delegue General pour l'Armement. Spiropyran compounds of piperidine or thiazine rings. 4,287,337, Cl. 544-6.000.

Guido, Paul V., to Foster Wheeler Energy Corporation. Coordinated control system for an electric power plant. 4,287,430, Cl. 290-40.00C.

Guignard, Claude, to Battelle Memorial Institute. Device for forming a nonwoven product from a fluid dielectric substance and process. 4,287,139, Cl. 264-10.000.

Gulati, Suresh T.; and Spycher, Anton A., to Corning Glass Works. Method for finishing glass-plastic laminated lens blanks. 4,287,018, Cl. 156-645.000.

Gulino, James A.: *See—*
Woodring, William J.; and Gulino, James A., 4,287,263, Cl. 428-489.000.

Gullotti, Damian V.; Damon, Lloyd E.; Chatfield, Phillip A.; and Winter, Joseph, to Olin Corporation. Process for joining narrow width thin gage metal or alloy strip. 4,286,744, Cl. 228-125.000.

Gursky, Michael T.; and Pcihoda, William W., to Western Electric Co., Inc. Apparatus for making carrier tape. 4,286,860, Cl. 354-319.000.

Gutierrez, Jean-Marie: *See—*
Galves, Jean-Pierre; and Gutierrez, Jean-Marie, 4,287,230, Cl. 427-65.000.

Gutierrez, William A.; Wilson, Herbert L.; and Yee, Edward M., to United States of America, Army. Method of making negative electron affinity photocathode. 4,286,373, Cl. 29-572.000.

Gutlhuber, Friedrich: *See—*
Moller, Friedrich-Wilhelm; Buchold, Henning; Klein, Helmut; Garkisch, Otto-Ludwig; Gutlhuber, Friedrich; and Laber, Walter, 4,287,375, Cl. 585-440.000.

Gutmann, Johannes A.: *See—*
Gay, Michael J.; and Gutmann, Johannes A., 4,287,530, Cl. 358-23.000.

Guy, Robert. Transillumination diagnostic system. 4,286,602, Cl. 128-665.000.

Gysling, Henry J., to Eastman Kodak Company. Tellurium(II) compounds and complexes having organic moieties containing silicon. 4,287,354, Cl. 556-465.000.

Hackert, Karl-Heinz; and Blume, Helmut, to Mannesmann Aktiengesellschaft. Covering a steel pipe having a welding seam with a thermoplastic coating. 4,287,223, Cl. 427-9.000.

Haeusser, Harry C.: *See—*
Schuller, James T.; and Haeusser, Harry C., 4,286,703, Cl. 194-100.00A.

Hafele, Walter; and Schenk, Bernhard, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines, particularly for diesel engines. 4,286,931, Cl. 417-490.000.

Hafner, Herbert: *See—*
Hargita, Tibor; Berlitz, Ingo; and Hafner, Herbert, 4,287,394, Cl. 200-5.00A.

Hagedorn, Myrna L.: *See—*
Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, 4,287,081, Cl. 252-174.110.

Hagedorn, Robert E.; Lobue, Alphonse T.; and Uhlman, Joseph G., to United States Steel Corporation. Self-replenishing seal for the gas offtake piping of a coke oven and sealing method. 4,286,792, Cl. 277-135.000.

Hager, Bror O. Method for wood preservation. 4,287,239, Cl. 427-351.000.

Hagerman, Brenda M.: *See—*
Hagerman, John D.; and Hagerman, Brenda M., 4,287,183, Cl. 424-157.000.

Hagerman, John D.; and Hagerman, Brenda M. Method of killing rodents. 4,287,183, Cl. 424-157.000.

Hahn, Douglas D.; Epley, Dennis E.; and Granle, Kenneth I., to Geo. A. Hormel & Company. Marking device. 4,286,599, Cl. 128-316.000.

Hahn, Erwin: *See—*
Horn, Dieter; Daubach, Ewald; Hahn, Erwin; Uhrig, Herbert; Hoene, Richard; and Naarmann, Herbert, 4,286,959, Cl. 8-524.000.

Hahn, Klaus; Rath, Hans P.; and Walter, Manfred, to BASF Aktiengesellschaft. Particulate styrene polymers containing blowing agent. 4,287,258, Cl. 428-407.000.

Hahn, Norbert, to Rite-Hite Corporation. Assembly for weather-sealing a joint. 4,286,410, Cl. 49-33.000.

Hahndorff, Axel, to Siemens Aktiengesellschaft. Surge voltage arrester with reduced minimum operating surge voltage. 4,287,548, Cl. 361-120.000.

Hakoyama, Akiyoshi, to Hitachi, Ltd. CRT Hard copy apparatus with multi-directional sampling and printing. 4,287,521, Cl. 346-35.000.

Hakura, Akira: *See—*
Toyoshima, Kumao; Hakura, Akira; Nakanishi, Toshihiro; and Yoshizumi, Hajime, 4,287,185, Cl. 424-177.000.

Hall, Lee Z., to Palmer-Shile Company. Cantilever storage rack. 4,286,719, Cl. 211-193.000.

Halliburton Company: *See—*
Baker, Eugene E.; and Carter, Ernest E., Jr., 4,286,658, Cl. 166-186.000.
Streich, Steven G.; and Knox, Lloyd C., 4,286,629, Cl. 138-89.000.

Hamaker, Ralph A.: *See—*
Castelli, Vittorio; and Hamaker, Ralph A., 4,286,706, Cl. 198-806.000.

Hamerdinger, Randolph W.: *See—*
Wang, Shing C.; and Hamerdinger, Randolph W., 4,287,484, Cl. 331-94.50G.

Hamlin, Robert N.; and Dickinson, William W., to Sun Oil Company of Pennsylvania. Wet gas scrubbing of particulates. 4,286,973, Cl. 55-92.000.

Hammann, Ingeborg: *See—*
Fuchs, Rainer; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,287,208, Cl. 424-304.000.

Hammar, Richard H.; and Harvey, Douglas J., to General Motors Corporation. Lightweight laminated grid for lead acid-storage batteries. 4,286,362, Cl. 29-2.000.

Hammer, Klaus-Dieter; Schroder, Martin; Pietruck, Horst; and Bytzek, Max, to Hoechst Aktiengesellschaft. Multiple-layer tubing. 4,287,217, Cl. 426-105.000.

Hanamura, Yoshimi: *See—*
Kitagawa, Yoshihiko; Hanamura, Yoshimi; Yuyama, Masahiro; Moritani, Masahiko; Sakuramoto, Akira; and Suzuki, Mikio, 4,287,317, Cl. 525-309.000.

Hancor, Inc.: *See—*
Fouss, James L.; and Parker, John J., 4,286,808, Cl. 285-158.000.

Handley, Charles L.; and Ostheim, James R., to Charade Hair and Skin Care Center, Inc. Hair roller. 4,286,608, Cl. 132-40.000.

Hanmyo, Masayuki: *See—*
Honda, Akira; Taguchi, Kiyomi; Hanmyo, Masayuki; Ishikawa, Masaru; and Kitamura, Minoru, 4,286,647, Cl. 164-153.000.

Hans Sickinger Company: *See—*
Pfaffle, Ernst, 4,286,908, Cl. 414-115.000.

Hantusch, Gerald H., to International Computers Limited. Large scale integrated circuit production. 4,286,374, Cl. 29-580.000.

Happer, George T., to Happer Systems Limited. Surface ducting. 4,286,630, Cl. 138-92.000.

Happer Systems Limited: *See—*
Happer, George T., 4,286,630, Cl. 138-92.000.

Hardesty, Keith C.; and Lukensmeyer, Gene L., to Wales, James R. Graduated leverage piano action. 4,286,493, Cl. 84-237.000.

Hargita, Tibor; Berlitz, Ingo; and Hafner, Herbert, to Wilhelm Ruf KG. Keyboard switch assembly with printed circuit board. 4,287,394, Cl. 200-5.00A.

Harney, David E.; Harney, Marilyn J.; and O'Boyle, Matthew, to Catalyst Research Corporation. Plural cell battery structure. 4,287,273, Cl. 429-153.000.

Harney, Marilyn J.: *See—*
Harney, David E.; Harney, Marilyn J.; and O'Boyle, Matthew, 4,287,273, Cl. 429-153.000.

Harold, Richard R.: *See—*
Tersteeg, Glenn E.; and Harold, Richard R., 4,287,155, Cl. 422-64.000.

Harrell, James E.: *See—*
Casinelli, Dominic L., 4,286,968, Cl. 44-1.00R.

Harreus, Albrecht: *See—*
Hermann, Hans D.; and Harreus, Albrecht, 4,287,107, Cl. 260-28.50R.

Harrington, F. Eugene: *See—*
Babington, Ronald G.; Harrington, F. Eugene; and Houlihan, William J., 4,287,196, Cl. 424-251.000.

Harrington, Richard P.; and Harrington, Russell J. Universally pivotal padlock and staple shielding hasp. 4,286,814, Cl. 292-281.000.

Harrington, Russell J.: *See—*
Harrington, Richard P.; and Harrington, Russell J., 4,286,814, Cl. 292-281.000.

Harris, Frederick J., to Olin Corporation. Fastener guidance and retention tip member. 4,286,496, Cl. 411-441.000.

Harris, Norman; Dennis, Alan J.; and Harrison, George E., to Davy McKee (Oil & Chemicals) Limited. Production of tetrahydrofuran. 4,287,127, Cl. 260-346.110.

Harris, Norman; and Shevels, Thomas F., to Davy McKee (Oil & Chemicals) Limited. Hydroformylation of alkenes to aldehydes. 4,287,369, Cl. 568-454.000.

Harris, Norman; Dennis, Alan J.; and Shevels, Thomas F., to Davy McKee (Oil & Chemicals) Limited. Hydroformylation process for the production of n-valeraldehyde. 4,287,370, Cl. 568-454.000.

Harris, Paul J.: *See—*
Phillips, Kenneth G.; and Harris, Paul J., 4,287,331, Cl. 528-397.000.

Harris, Robert F.: *See—*
Tefertiller, Nancy B.; Burdett, Kenneth A.; and Harris, Robert F., 4,287,323, Cl. 525-404.000.

Harris, Ronald K.: *See—*
Kuhn, J. Bruce; Utecht, Klaus P.; and Harris, Ronald K., 4,286,402, Cl. 43-17.200.

Harris & Thrush Manufacturing Company: *See—*
Johnson, Don R., 4,286,511, Cl. 100-35.000.

Harrison, George E.: *See—*
Harris, Norman; Dennis, Alan J.; and Harrison, George E., 4,287,127, Cl. 260-346.110.

Harrison, John E., Sr., to John D. Hollingsworth on Wheels, Inc. Card cylinder shroud, flat mounting and bearing assembly. 4,286,357, Cl. 19-98.000.

Harthun, Norman E.: *See—*
Vosper, Ralph R.; Spoormaker, Arie W; Binasik, Chester S.; and Harthun, Norman E., 4,286,945, Cl. 432-29.000.

Hartley, Henry F.: *See—*
Darden, Boyd E.; and Hartley, Henry F., 4,287,562, Cl. 364-200.000.

Hartley, Robert R.; and Konrad, Joseph A., to United States of America, Navy. Teletypewriter loop switching matrix. 4,287,387, Cl. 178-2.00R.

Harvey, Douglas J.: *See—*
Hammar, Richard H.; and Harvey, Douglas J., 4,286,362, Cl. 29-2.000.

Harvey, Leslie E.; and Spiva, Stephan D., to Carlos Enterprises. Bowling practice device. 4,286,784, Cl. 273-54.00D.

Harzer, Peter, to Wandel & Goltermann. Process and circuit arrangement for the measuring of coefficients of message-transmission equipment. 4,287,469, Cl. 324-57.00R.

Hase, Christian: *See—*
Stober, Reinhard; Wirthwein, Rolf; and Hase, Christian, 4,287,135, Cl. 260-502.00R.

Hasegawa, Hiroshi, to Nippon Kogaku K.K. Electromagnetic releasing device. 4,286,855, Cl. 354-234.000.

Hasegawa, Hiroshi; and Maida, Osamu, to Nippon Kogaku K.K. Circuit for charging a release magnet energizing capacitor in a camera. 4,287,549, Cl. 361-156.000.

Hashimoto, Kazunori: *See—*
Tanaka, Satoru; Shimada, Katsutoshi; Hashimoto, Kazunori; Ema, Kiichi; and Udea, Koichiro, 4,287,346, Cl. 546-330.000.

Hashimoto, Kenji, to Aisin Seiki Kabushiki Kaisha. Solenoid actuated valve device. 4,286,767, Cl. 251-65.000.

Hashimoto, Tadashi; and Jindou, Katsuya, to TDK Electronics Co., Ltd. Distributed constant type filter. 4,287,494, Cl. 333-202.000.

Haskins, Steve W.: *See—*
Adams, William J.; Moorse, Jeffrey W.; and Haskins, Steve W., 4,286,835, Cl. 339-17.00F.

Haubner, Georg; Wesemeyer, Jurgen; Schrumpf, Hans; Birmelin, Jorg; Schwab, Manfred; Honig, Gunter; Kiencke, Uwe; Schulz, Alfred; and Meier, Werner, to Robert Bosch GmbH. Monitoring system for program controlled apparatus. 4,287,565, Cl. 364-580.000.

Havaco Incorporated: *See—*
Stevenson, Robert L., 4,286,500, Cl. 91-180.000.

Hawk, Gene R. Cover for dental handpiece bur. 4,286,950, Cl. 433-116.000.

Hayashi, Yoshihiro: *See—*
Usami, Susumu; Hayashi, Yoshihiro; Nakaho, Junichi; and Yasumatsu, Jun, 4,286,759, Cl. 242-107.200.

Hayden, Harold E. Derailment emergency valve. 4,286,763, Cl. 246-172.000.

Haynes, Munro K.: *See—*
Cheatham, Samuel D.; and Haynes, Munro K., 4,287,540, Cl. 360-18.000.

Heath, Rodney T.; and Gerlach, C. Richard, to Heath, Rodney T. Dual pressure gas motor, and method of operation. 4,286,929, Cl. 417-404.000.

Hechenberger, Dieter: *See—*
Dickmann, Heinz H.; Hechenberger, Dieter; and Krattner, Richard, 4,286,890, Cl. 401-19.000.

Heemskerk, Rutgerus S., to SKF Industrial Trading & Development Co. B. V. Bearing for high rotational speeds. 4,286,829, Cl. 308-187.000.

Heeres, Jan; and Hendrickx, Robert, to Janssen Pharmaceutica, N.V. Heterocyclic derivatives of [4-(piperazin-1-yl-phenyloxymethyl)-1,3-dioxolan-2-ylmethyl]-1H-imidazoles and 1H-1,2,4-triazoles. 4,287,195, Cl. 424-250.000.

Hefner, Robert E., Jr.; and Tomalia, Donald A., to Dow Chemical Company, The. Alkyl-substituted phenyl ether amine collectors in flotation. 4,287,052, Cl. 209-166.000.

Heim, Alan M.: *See—*
Raber, Samuel; Wynne, John M.; and Heim, Alan M., 4,287,515, Cl. 340-584.000.

Heimbach, Klaus-Jurgen; and Zultzke, Walter, to Leybold-Heraeus GmbH. Method for regulating the evaporation rate of oxidizable substances in reactive vacuum deposition. 4,287,224, Cl. 427-42.000.

Heimberg, Manfred, to National Distillers and Chemical Corp. Emulsion process for preparing elastomeric vinyl acetate-ethylene copolymer and high Mooney viscosity low gel content elastomer obtained therefrom. 4,287,329, Cl. 526-202.000.

Heintz, Robert A.: *See—*
McArthur, Donald N.; and Heintz, Robert A., 4,286,954, Cl. 493-244.000.

Heinzer, Paul: *See—*
Amon, Albert; Weil, Roger; and Heinzer, Paul, 4,287,234, Cl. 427-150.000.

Helsley, Grover C.; Dornauer, Horst; and Davis, Larry, to American Hoechst Corporation. 2-Aryl-1,2-dialkylcycloalkylamines. 4,287,212, Cl. 424-330.000.

Hendrickx, Robert: *See—*
Heeres, Jan; and Hendrickx, Robert, 4,287,195, Cl. 424-250.000.

Henkel Kommanditgesellschaft auf Aktien: *See—*
Bechstedt, Wolfgang, 4,286,956, Cl. 8-137.000.

Henle, Robert A.: *See—*
Cavaliere, Joseph R.; Henle, Robert A.; Konian, Richard R.; and Walsh, James L., 4,287,435, Cl. 307-255.000.

Henneberg, Hasso; Hesse, Werner; and Junike, Wilhelm, to Gildemeister AG. Tool holding turret for rotating machine. 4,286,483, Cl. 82-2.00R.

Hentzschel, Erhard; Jaspert, Erhard; and Niederhoff, Kurt, to Mannesmann AG. Controlling upsetting during welding of a split tube. 4,287,402, Cl. 219-61.500.

Hercules Incorporated: *See—*
Gendron, Aime J., 4,286,940, Cl. 425-533.000.
Gendron, Aime J., 4,287,150, Cl. 264-538.000.

Herman, George A., Jr.: *See—*
Stelben, John J.; Siladi, Kim E.; Herman, George A., Jr.; and Vesel, John E., 4,286,866, Cl. 355-14.00D.

Hermann Berstorff Maschinenbau GmbH: *See—*
Koch, Klaus, 4,287,157, Cl. 422-205.000.

Hermann Finckh Maschinenfabrik GmbH & Co., Firma: *See—*
Holz, Emil, 4,287,055, Cl. 209-240.000.

Hermann, Hans D.; and Harreus, Albrecht, to Hoechst Aktiengesellschaft. Transparent polyvinyl butyral sheet and process for the manufacture thereof. 4,287,107, Cl. 260-28.50R.

Hermann, Robert R.: *See—*
Clay, Robert A., 4,286,928, Cl. 417-329.000.

Herr, James E., to Kerr Glass Manufacturing Corporation. Dropper assembly. 4,286,633, Cl. 141-24.000.

Herrod, Don W.: *See—*
Swift, William R.; Herrod, Don W.; and Marsh, James M., 4,287,564, Cl. 364-525.000.

Hess, Hans-Jurgen E.; Bindra, Jasjit S.; and Shah, Praful K., to Pfizer Inc. Alkoxy-substituted-6-chloro-quinazoline-2,4-diones. 4,287,341, Cl. 544-285.000.

Hesse, Werner: *See—*
Henneberg, Hasso; Hesse, Werner; and Junike, Wilhelm, 4,286,483, Cl. 82-2.00R.

Hettinga, Siebolt, to Parachem Corporation. Soap leaf sheet dispenser. 4,286,731, Cl. 221-259.000.

Heuer, Daniel A.: *See—*
Borg, Arthur N.; Trostel, Jerry D.; and Heuer, Daniel A., 4,287,601, Cl. 455-186.000.

Heyer, Willy: *See—*
Merten, Gerhard; Peters, Wolfgang; Schneider, Hans-Dieter; and Heyer, Willy, 4,286,823, Cl. 299-43.000.

Heymes, Rene; and Lutz, Andre, to Roussel Uclaf. Syn isomers of 7-[2-(2-amino-4-thiazolyl)-2-(carboxymethyloxyimino)-acetamido]-ceph-3-eme-4-carboxylic acid compounds. 4,287,193, Cl. 424-246.000.

Heyneman, Guido: *See—*
Vanhumbeeck, Jacky; De Steur, Hubert; Heyneman, Guido; and Vandenbossche, Chris, 4,286,965, Cl. 23-230.00A.

Heyser, Richard C., to United States of America, National Aeronautics and Space Administration. Method for shaping and aiming narrow beams. 4,287,578, Cl. 367-88.000.

Higgins, Janet D. Christmas candle package. 4,286,710, Cl. 206-216.000.

Higley, David P.: *See—*
Convers, Ronald J.; Higley, David P.; and DeBernardi, James A., 4,287,089, Cl. 252-414.000.

Hiltebeitel, John A.: *See—*
Chakravarti, Satya N.; and Hiltebeitel, John A., 4,287,571, Cl. 365-104.000.

Himmelmann, Wolfgang; Bruck, Rolf; Sauerteig, Wolfgang; Kruck, Peter; Kolb, Gunter; and Sackmann, Gunter, to Agfa-Gevaert AG. Process for the production of matting layers. 4,287,299, Cl. 430-537.000.

Hiramatsu, Yasuzo: *See—*
Fujmura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,287,207, Cl. 424-282.000.

Hiromae, Yoshitaka; Nakamura, Kazuo; and Nitto, Hajime, to Nippon Steel Corporation. Annealing separator for grain oriented silicon steel strips. 4,287,006, Cl. 148-27.000.

Hirsch, Arnold L.: *See—*
Klausmeier, William H.; Johnson, Richard L.; and Hirsch, Arnold L., 4,287,129, Cl. 260-397.100.

Hisakawa, Minoru; and Okamoto, Tsugio, to Brother Kogyo Kabushiki Kaisha. Endless ribbon cassette. 4,286,887, Cl. 400-196.100.

Hisaki, Masakatu: *See—*
Fujmura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,287,207, Cl. 424-282.000.

Hitachi Koki Company Limited: *See—*
Katagiri, Shigenobu; Nakano, Hiroshige; and Matsuzaki, Kazuo, 4,286,517, Cl. 101-93.140.

Hitachi, Ltd.: *See—*
Arita, Setsuo; and Sato, Takao, 4,287,508, Cl. 340-150.000.
Hakoyama, Akiyoshi, 4,287,521, Cl. 346-35.000.
Kuwabara, Kouji; Sugawara, Hiroyuki; Shirakura, Toshiharu; Sasaki, Kouji; and Takemori, Satoshi, 4,287,487, Cl. 331-94.50G.
Yamaguchi, Yuzo, 4,286,919, Cl. 415-112.000.

Hitachi Medical Corporation: *See—*
Tomita, Chuji; Abe, Hiroshi; and Shimazu, Katashi, 4,287,424, Cl. 250-445.00T.

Hobart Corporation: *See—*
Treiber, Fritz F.; and Margraf, Dallas A., 4,287,407, Cl. 219-273.000.

Hobbs, Stanley Y.: *See—*
Eustance, John W.; Hobbs, Stanley Y.; and Carley, Emilie L., 4,287,249, Cl. 428-141.000.

Hodgeman, Herbert H.: *See—*
Tomlin, Jerry B.; and Hodgeman, Herbert H., 4,286,625, Cl. 137-625.430.

Hoechst Aktiengesellschaft: *See—*
Fauth, Heinrich; and Koch, Werner, 4,287,334, Cl. 536-60.000.
Gessner, Wolfgang; Kuhn, Helmut; and Plotz, Kurt, 4,287,248, Cl. 428-137.000.
Hammer, Klaus-Dieter; Schroder, Martin; Pietruck, Horst; and Bytzek, Max, 4,287,217, Cl. 426-105.000.
Hermann, Hans D.; and Harreus, Albrecht, 4,287,107, Cl. 260-28.50R.
Hunger, Klaus; Klappert, Ernst; and Lohe, Konrad, 4,287,122, Cl. 260-203.000.
Schneider, Manfred; Kruse, Hubert; Opitz, Konrad; and Billenstein, Siegfried, 4,286,960, Cl. 8-527.000.
Siegemund, Gunter; and Muffler, Herbert, 4,287,124, Cl. 260-340.90R.

Hoegerle, Karl, to Ciba-Geigy Corporation. 2,4,6-Trihalo-5-alkyl-and 5-alkenylsulphonylpyrimidines. 4,287,342, Cl. 544-298.000.

Hoene, Richard: *See—*
Horn, Dieter; Daubach, Ewald; Hahn, Erwin; Uhrig, Herbert; Hoene, Richard; and Naarmann, Herbert, 4,286,959, Cl. 8-524.000.

Hoersch, Werner, to Thies GmbH & Co. Apparatus for surface treatment of an endless textile structure. 4,286,395, Cl. 34-155.000.

Hoeschele, James D., to Engelhard Minerals & Chemicals Corporation. Method for treating tumors with cis-diammineplatinum(II) orthophosphate complexes. 4,287,187, Cl. 424-199.000.

Hoffmann, Ronald C.: *See—*
Searcy, James A.; Zoellner, Roger O.; and Hoffmann, Ronald C., 4,286,572, Cl. 126-299.00D.

Hofmann, Peter: *See—*
Dohm, Klaus-Dieter; and Hofmann, Peter, 4,287,130, Cl. 260-413.000.

Hogg, Walter R.; and Brunsting, Albert, to Coulter Electronics, Inc. Apparatus and method for measuring scattering of light in particle detection systems. 4,286,876, Cl. 356-343.000.

Holbek, Kjeld, to Rockwool International A/S. Process for the production of mineral wool products. 4,287,142, Cl. 264-37.000.

Hollingsworth, Clinton A., to Deister Concentrator Co., Inc., The. Flotation apparatus for concentration of minerals. 4,287,054, Cl. 209-170.000.

Hollis, Ben R., Jr.: *See—*
Belcher, Jewell G., Jr.; and Hollis, Ben R., Jr., 4,286,542, Cl. 118-423.000.

Hollowell, William: *See—*
Ziv, Avraham; Tanaka, Akira; Hollowell, William; Sieber, William J.; and Ahad, Munir J., 4,287,398, Cl. 200-61.45R.

Holst, Hartwig: *See—*
Zahner, Hans; Holst, Hartwig; Zoebelein, Gerhard; and Keckeisen, Adelinde, 4,287,186, Cl. 424-181.000.

Holt, Raleigh A., Jr. Portable dental apparatus. 4,286,949, Cl. 433-103.000.

Holtje, Wilfried G.; Senkler, George H.; and Taggi, Arthur J., to Du Pont de Nemours, E. I., and Company. Light stable quinacridonequinone yellow pigment. 4,286,998, Cl. 106-288.00Q.

Holz, Emil, to Hermann Finckh Maschinenfabrik GmbH & Co., Firma. Method of sorting fibre suspensions as well as a pressure sorter for performing the method. 4,287,055, Cl. 209-240.000.

Holzschuh, Jack E., to United States of America, Navy. Miniaturized scan within a pulse sonar. 4,287,580, Cl. 367-105.000.

Homeyer, Bernhard: *See—*
Fuchs, Rainer; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,287,208, Cl. 424-304.000.

Honda, Akira; Taguchi, Kiyomi; Hanmyo, Masayuki; Ishikawa, Masaru; and Kitamura, Minoru, to Nippon Kokan Kabushiki Kaisha. Apparatus for preventing steam explosion in water discharge channel of secondary cooling zone caused by molten metal breaking out from cast strand in horizontal type continuous casting machine. 4,286,647, Cl. 164-153.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Inoue, Haruo; Yokota, Shigeru; and Saito, Yoshiharu, 4,286,819, Cl. 296-65.00R.
Kume, Tadashi; and Inoh, Isamu, 4,287,059, Cl. 210-188.000.
Ohmori, Taiji; Sato, Makoto; and Tsuchiya, Yoshikazu, 4,287,505, Cl. 340-52.00B.

Honecker, Siegfried: *See—*
Jager, Gerd; Bernuth, Wolfgang; Irrgang, Klaus; Wendt, Hans-Joachim; and Honecker, Siegfried, 4,286,879, Cl. 356-358.000.

Honeywell Information Systems Inc.: *See—*
Darden, Boyd E.; and Hartley, Henry F., 4,287,562, Cl. 364-200.000.

Honig, Gunter: *See—*
Haubner, Georg; Wesemeyer, Jurgen; Schrumpf, Hans; Birmelin, Jorg; Schwab, Manfred; Honig, Gunter; Kiencke, Uwe; Schulz, Alfred; and Meier, Werner, 4,287,565, Cl. 364-580.000.

Honna, Takaji: *See—*
Fujmura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,287,207, Cl. 424-282.000.

Hoover, Richard B.; and Rhodes, Charles M., to United States of America, National Aeronautics and Space Administration. Method of for retarding dye fading during archival storage of developed color photographic film. 4,287,152, Cl. 422-40.000.

Hoover Universal, Inc.: *See—*
Straus, Albert E., 4,286,619, Cl. 137-426.000.

Horizon Manufacturing Corporation: *See—*
Anderson, Eugene R., 4,287,169, Cl. 423-579.000.

Horn, Dieter; Daubach, Ewald; Hahn, Erwin; Uhrig, Herbert; Hoene, Richard; and Naarmann, Herbert, to BASF Aktiengesellschaft. Disperse dye formulations. 4,286,959, Cl. 8-524.000.

Horrobin, David F. Treatment and/or prophylaxis of spasms of coronary arteries. 4,287,202, Cl. 424-274.000.

Hortman, Michael T.: *See—*
McMurtry, Carl H.; Naum, Robert G.; Owens, Dean P.; and Hortman, Michael T., 4,287,145, Cl. 264-109.000.

Hosler, Klaus: *See—*
Tax, Hans; and Hosler, Klaus, 4,286,722, Cl. 212-242.000.

Hosono, Takashi: *See—*
Mitamura, Ichiro; Tooyama, Akira; and Hosono, Takashi, 4,287,531, Cl. 358-67.000.

Hostettler, Fritz, to Plastics Technology Associates, Inc. Integral skin microcellular polyester base polyurethane elastomers. 4,287,307, Cl. 521-51.000.

Houghton, Geoffrey, to Loewy Robertson Engineering Co. Ltd. Mill control. 4,286,448, Cl. 72-21.000.

Houle, Philip J.; and Oliver, Robert G., to Gloucester Engineering Co., Inc. Grid extensions on a rotary stacker. 4,286,907, Cl. 414-72.000.

Houlihan, William J.: *See—*
Babington, Ronald G.; Harrington, F. Eugene; and Houlihan, William J., 4,287,196, Cl. 424-251.000.

Howard, Dennis D.: *See—*
McDowell, John [illegible] Howard, Dennis D.; and Pascarella, Vincent J., 4,287,083, Cl. 252-182.000.

Howard, Walter E. [illegible], for pit viper. 4,286,405, Cl. 43-87.000.

Howe, Milton A., Jr., to W. R. Grace & Co., Cryovac Division. Walking beam bag loader. 4,286,422, Cl. 53-473.000.

Hsieh, Jaw J., to Massachusetts Institute of Technology. GaInAsP/InP Double-heterostructure lasers. 4,287,485, Cl. 331-94.50H.

Hsieh, Shuang-shii: *See—*
Lehr, James R.; and Hsieh, Shuang-shii, 4,287,053, Cl. 209-167.000.

Huang, Liang H.: *See—*
Celmer, Walter D.; Cullen, Walter P.; Huang, Liang H.; Oscarson, John R.; Shibakawa, Riichiro; and Tone, Junsuke, 4,287,182, Cl. 424-118.000.

Hubbard, Arthur L., to Deere & Company. Blockage detector for a cotton harvester. 4,286,424, Cl. 56-10.200.

Hubele, Adolf: *See—*
Eckhardt, Wolfgang; Kunz, Walter; and Hubele, Adolf, 4,287,210, Cl. 424-309.000.

Huber, Willi: *See—*
Wagner, Josef; and Huber, Willi, 4,287,552, Cl. 361-228.000.

Hubertson, Folke H., to Aktiebolaget Somas Ventiler. Valve seat. 4,286,769, Cl. 251-174.000.

Huck, Joseph F. Color screen indicator. 4,286,385, Cl. 33-1.00N.

Hudgens, David C., Jr.: *See—*
Esakov, Michael D.; Hudgens, David C., Jr.; and Stringer, Frederick D., 4,287,151, Cl. 264-560.000.

Huignard, Jean-Pierre; Leclerc, Pierre; Carballes, Jean-Claude; and Nappo, Armand, to Thomson-CSF. Compact optical structure with integrated source. 4,286,838, Cl. 350-96.110.

Hullstrung, Dieter; and Trimbach, Jurgen, to Bayer Aktiengesellschaft. Process for the preparation of thiazolidine-2-thiones. 4,287,350, Cl. 548-182.000.

Hulse, David O.: *See—*
Mekosh, George, Jr.; and Hulse, David O., 4,286,797, Cl. 280-80.00B.

Hung, Chih P.: *See—*
Ko, Wen H.; and Hung, Chih P., 4,287,471, Cl. 324-61.00R.

Hung, David P. J. Kenshin heating instrument. 4,286,571, Cl. 126-206.000.

Hunger, Klaus; Klappert, Ernst; and Lohe, Konrad, to Hoechst Aktiengesellschaft. Monoazo compounds from 1-aminobenzene-2-carboxylic acid derivatives and their use as colorants. 4,287,122, Cl. 260-203.000.

Hungerford, Gordon P., to Mobil Oil Corporation. Multilayer film manufacture utilizing scrap resin. 4,287,147, Cl. 264-146.000.

Hunt, Earl R.: *See—*
Rosler, Robert K.; Gore, Donald B.; Riddell, Malcolm N.; and Hunt, Earl R., 4,287,105, Cl. 260-18.0EP.

Hunter, William H., to Maytag Company, The. Assured slow speed spin for fabric washing machine. 4,286,443, Cl. 68-12.00R.

Hurko, Bohdan; and Dills, Raymond L., to General Electric Company. Method of manufacture for a resistance heater and temperature sensor. 4,286,377, Cl. 29-612.000.

Hurt, William S., to Rohm and Haas Company. O,S-Dialkyl O-oxysulfonylphenyl phosphorothiolates and phosphorodithioates. 4,287,189, Cl. 424-210.000.

Hussain, Syed N.: *See—*
Braksmayer, Diza P.; and Hussain, Syed N., 4,287,119, Cl. 260-45.95L.

Hustedt, Hans, to Desma-Werke GmbH. Injection casting apparatus for shoe soles. 4,286,936, Cl. 425-119.000.

Huston, William D., Jr., to Motorola, Inc. Versatile microprocessor bus interface. 4,287,563, Cl. 364-200.000.

Huszti, Zsuzsanna: *See—*
Kosa, Edit; Borvendeg, Janos; Huszti, Zsuzsanna; Kosary, Judit; Szilagyi, Geza; Tardos, Laszlo; Kasztreiner, Endre; Nagy, Laszlo; Szuucs, Erzsebet; and Kiss, Gabriella, 4,287,194, Cl. 424-248.510.

Hvide, J. Erik. Seagoing separable tug and barge construction. 4,286,537, Cl. 114-248.000.

Hydrocarbon Research, Inc.: *See—*
Sirkar, Amalesh K., 4,287,088, Cl. 252-414.000.

I.B.P. Industrie Buitoni Perugina S.p.A.: *See—*
Mangano, Santi F., 4,287,216, Cl. 426-93.000.

Ibbotson, Peter; Smith, John C.; and Frodsham, Colin, to Pakcel Converters Limited. Composite flexible film laminate. 4,287,274, Cl. 429-156.000.

Ichimura, Kunihiro, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Nitrogen-containing heterocyclic compound having acetal group and method for manufacture thereof. 4,287,335, Cl. 542-455.000.

Ichise, Yoshiju, to Nippon Wiper Blade Co., Ltd. Windscreen wiper blade. 4,286,350, Cl. 15-250.320.

ICI Americas Inc.: *See—*
Burns, Joseph P., 4,287,116, Cl. 260-37.00N.

Iguchi, Shigeru: *See—*
Iwata, Tamotsu; and Iguchi, Shigeru, 4,287,293, Cl. 430-232.000.

Iizawa, Osamu: *See—*
Fujiwara, Shinobu; Furukawa, Kiyoshi; Kikuchi, Nobuaki; Iizawa, Osamu; Tanaka, Hitoshi; and Ueoka, Hisayoshi, 4,287,075, Cl. 106-39.500.

Ike, Toshiharu: *See—*
Taniguchi, Yasuo; Ike, Toshiharu; and Nakaya, Hideo, 4,287,311, Cl. 525-58.000.

Ikeda, Minoru, to France Bed Co., Ltd. Mattress. 4,286,344, Cl. 5-424.000.

Ikeda, Toshimitsu: *See—*
Matsumoto, Shoji; Matsui, Toshikazu; Ikeda, Toshimitsu; Kozuka, Nobuhiko; Nishihama, Hitoshi; and Aizawa, Tatsuo, 4,286,861, Cl. 355-3.00R.

Illinois Tool Works Inc.: *See—*
Platt, John R.; and Benno, Edward L., 4,286,711, Cl. 206-216.000.

Ilzig, Karl F.; and Scheidemann, Hans, to Original Hanau Heraeus GmbH. Light directing control system, particularly for medical operating and diagnostic use. 4,286,839, Cl. 350-96.240.

Imamura, Haruo: *See—*
Okuno, Noboru; Takeuchi, Takashi; Tsuzuku, Akihiko; Tanazawa, Masao; Nakajima, Minoru; and Imamura, Haruo, 4,286,935, Cl. 425-72.00R.

Imperial Chemical Industries Limited: *See—*
Allen, Christopher S., 4,287,003, Cl. 134-31.000.
Maslin, Raymond; and Linnhoff, Bodo, 4,287,377, Cl. 585-634.000.

Imperial Group Limited: *See—*
Goslin, John K.; Bugler, John H.; and Foster, Howard, 4,286,605, Cl. 131-358.000.

IMS Limited: *See—*
Ogle, Robert W., 4,286,389, Cl. 34-5.000.

Incosym, Inc.: *See—*
Craig, Robert J. G., 4,286,370, Cl. 29-434.000.

Index-Werke KG Hahn & Tessky: *See—*
Gatzki, Helmut H., 4,286,484, Cl. 82-32.000.

Infusaid Corporation: *See—*
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Inoh, Isamu: *See—*
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Inokuchi, Nobuyuki: *See—*
Matsunami, Muneharu; Kubota, Tatsushi; Yoshida, Akio; and Inokuchi, Nobuyuki, 4,286,805, Cl. 280-803.000.

Inoue, Haruo; Yokota, Shigeru; and Saito, Yoshiharu, to Honda Giken Kogyo Kabushiki Kaisha. Rear seat for cars. 4,286,819, Cl. 296-65.00R.

Inoue, Hiromitsu; Ohashi, Hiroshi; and Kondo, Mikio, to Matsushita Electric Works, Ltd. Moving object detecting device. 4,287,579, Cl. 367-94.000.

Inoue, Kozi: *See—*
Ando, Seiya; and Inoue, Kozi, 4,287,064, Cl. 210-413.000.

Institut de Recherches de la Siderurgie Francaise: *See—*
Lechevallier, Christian; Cordier, Jacques; and Antoine, Martine, 4,287,045, Cl. 204-243.00R.

Institut Francais du Petrole: *See—*
Nguyen, Jean-Paul; Laval, Emmanuel; and Cendre, Andre, 4,286,676, Cl. 175-74.000.

Intel Corporation: *See—*
Stark, Moshe, 4,287,570, Cl. 365-104.000.

International Business Machines Corp.: *See—*
Brosch, Rudolf; Schettler, Helmut; Schumacher, Hans; and Zuehike, Rainer, 4,287,437, Cl. 307-296.00R.
Cavaliere, Joseph R.; Henle, Robert A.; Konian, Richard R.; and Walsh, James L., 4,287,435, Cl. 307-255.000.
Chakravarti, Satya N.; and Hiltebeitel, John A., 4,287,571, Cl. 365-104.000.
Cheatham, Samuel D.; and Haynes, Munro K., 4,287,540, Cl. 360-18.000.
Eardley, David B.; and Matick, Richard E., 4,287,575, Cl. 365-174.000.
Kadehjian, Leo J.; Sachdev, Harbans S.; and Snyder, Clinton D., 4,286,989, Cl. 106-22.000.
Liptay, John S., 4,287,561, Cl. 364-200.000.
Pricer, Wilbur D., 4,287,576, Cl. 365-203.000.
Promis, George G.; Smith, Gerald L.; and Wilson, John C., 4,287,461, Cl. 318-571.000.
Soo, Suk S.; and Schwartz, Andrew M., 4,287,414, Cl. 250-227.000.
Stewart, Ralph J., 4,286,466, Cl. 73-863.830.

International Computers Limited: *See—*
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International Flavors & Fragrances Inc.: *See—*
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Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'-Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, 4,287,081, Cl. 252-174.110.
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International Harvester Company: *See—*
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International Quartz Ltd.: *See—*
Lam, Hau C.; Lee, Thomas K. P.; and Cheng, Y. C., 4,287,513, Cl. 340-562.000.

International Standard Electric Corporation: *See—*
Boute, Raymond T. G.; De Kinder, Wilfried L. J.; Neutjens, Gustaaf W. T.; Pochet, Andre G. G.; Vanderschoot, Jan P. M.; and Van Remortel, Jacques D. A., 4,287,590, Cl. 370-59.000.

International Telephone and Telegraph Corporation: *See—*
Goodman, David S.; Selvin, Gerald J.; Dubell, Edward G.; Doty, Donald J.; Erbe, Alfred R.; and Wilson, Robert E., 4,286,834, Cl. 339-16.00R.

Inukai, Mitsuo; and Kamiyama, Hajime, to Toyota Jidosha Kogyo Kabushiki Kaisha. Webbing retractor. 4,286,758, Cl. 242-107.000.

Iowa State University Research Foundation, Inc.: *See—*
Greer, Raymond T.; Vale, Bradley H.; and Knoll, Randall L., 4,286,341, Cl. 3-1.400.

Ippolitov, Vladimir V.: *See—*
Kapitanov, Nikolai N.; Petrova, Natalia P.; and Ippolitov, Vladimir V., 4,286,598, Cl. 128-303.00R.

Irrgang, Klaus: *See—*
Jager, Gerd; Bernuth, Wolfgang; Irrgang, Klaus; Wendt, Hans-Joachim; and Honecker, Siegfried, 4,286,879, Cl. 356-358.000.

Isaka, Kinichi: *See—*
Takeda, Mikio; Kishishita, Hiroshi; Kawabata, Hiroyuki; and Isaka, Kinichi, 4,287,449, Cl. 313-509.000.

Ishigaki, Isao: *See—*
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Ishihara, Tetsuo; and Kubo, Keizi, to Daicel Chemical Industries Ltd. Liquid composition for treating photosensitive laminates having alcohol-soluble polyamide layer. 4,287,297, Cl. 430-435.000.

Ishikawa, Masaru: *See—*
Honda, Akira; Taguchi, Kiyomi; Hanmyo, Masayuki; Ishikawa, Masaru; and Kitamura, Minoru, 4,286,647, Cl. 164-153.000.

Isohata, Shigeru: *See—*
Nozawa, Ryoichiro; Amemiya, Yoichi; Kawamata, Mitsuo; Isohata, Shigeru; Sasaki, Takao; and Takekoshi, Yoshitaka, 4,287,460, Cl. 318-571.000.

Italiano, Victor J.: *See—*
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Ito, Mikiji: *See—*
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Itoh, Kunio; Fukuda, Takeshi; and Matumura, Masaaki, to Shin-Etsu Chemical Co., Ltd. Primer compositions. 4,287,114, Cl. 260-37.0SB.

Iwamoto, Yoshinori: *See—*
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Iwata, Minoru: *See—*
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Iwata, Tamotsu; and Iguchi, Shigeru, to Mitsubishi Paper Mills, Ltd. Photographic element. 4,287,293, Cl. 430-232.000.

Izumi, Hirotaka: *See—*
Akita, Yukio; Izumi, Hirotaka; and Asano, Junichi, 4,286,862, Cl. 355-3.0SH.

J. I. Case Company: *See—*
Schulz, John C., 4,286,803, Cl. 280-764.000.

J. M. Voith GmbH: *See—*
Gross, Harald, 4,286,923, Cl. 416-43.000.

J. Wagner AG: *See—*
Wagner, Josef; and Huber, Willi, 4,287,552, Cl. 361-228.000.

Jackson, Alan D., to Cessna Aircraft Company, The. Deformable plug. 4,286,770, Cl. 251-285.000.

Jackson, Jesse J.: *See—*
Carlo, Dennis J.; Jackson, Jesse J.; and Stoudt, Thomas H., 4,287,173, Cl. 424-49.000.

Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., to Eastman Kodak Company. Copolyesters derived from aromatic polyesters and glycol polyesters. 4,287,325, Cl. 525-444.000.

Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., to Eastman Kodak Company. Process for improving the chemical resistance of aromatic polyesters. 4,287,332, Cl. 528-176.000.

Jacquet, Bernard; Papantoniou, Christos; and Mondet, Jean, to L'Oreal. Cosmetic compositions for the hair and the skin, based on polymers which contain amino groups and recurring units having a cyclic structure. 4,287,172, Cl. 424-47.000.

Jaeckh, Christof: *See—*
Rudolf, Peter; Steck, Werner; Koester, Eberhard; Ohlinger, Manfred; and Jaeckh, Christof, 4,287,233, Cl. 427-127.000.

Jaeger, Paul M.: *See—*
Ophir, Jonathan; Maklad, Nabil F.; and Jaeger, Paul M., 4,286,455, Cl. 73-1.0DV.

Jager, Gerd; Bernuth, Wolfgang; Irrgang, Klaus; Wendt, Hans-Joachim; and Honecker, Siegfried. Device, particularly for the digital measuring of force. 4,286,879, Cl. 356-358.000.

Jahn, Walter: *See—*
Scherenberg, Hans O.; Breitschwerdt, Werner; Klein, Wilhelm; and Jahn, Walter, 4,286,359, Cl. 24-230.00R.

Jain, Sulekh C.; and Morris, Charles A., to Wyman-Gordon Company. Water-based forging lubricant. 4,287,073, Cl. 252-30.000.

James, James R.; and Neathery, Michael P., to Accuratio Systems, Inc. Variable ratio dispensing apparatus. 4,286,732, Cl. 222-46.000.

Janes, Michael M.; and Orgill, Rodney H., to NCR Corporation. Topography for integrated circuit pattern recognition array. 4,287,507, Cl. 340-146.30Z.

Janome Sewing Machine Co., Ltd.: *See*—
Tonomura, Yoshinobu, 4,286,532, Cl. 112-314.000.
Janssen Pharmaceutica, N.V.: *See*—
Heeres, Jan; and Hendrickx, Robert, 4,287,195, Cl. 424-250.000.
Jantzen, Steve L., to ACF Industries, Inc. Pressurized hopper car interior side and roof bracing support structure. 4,286,524, Cl. 105-248.000.
Janzen, Jay, to Phillips Petroleum Company. Sample cell. 4,286,881, Cl. 356-440.000.
Japan Atomic Energy Research Inst.: *See*—
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Okada, Toshio; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, 4,287,272, Cl. 429-144.000.
Japan Latex Compounding Co., Ltd.: *See*—
Monden, Takeshi; Shiba, Yoshiro; Momonaka, Toshihiro; Kobayashi, Shigeru; and Oda, Kazuo, 4,287,242, Cl. 427-426.000.
Japan Synthetic Rubber Co., Ltd.: *See*—
Monden, Takeshi; Shiba, Yoshiro; Momonaka, Toshihiro; Kobayashi, Shigeru; and Oda, Kazuo, 4,287,242, Cl. 427-426.000.
Jaquith, Douglas, to Jaquith, Hope. Self adjusting bridge with locking pin for all viol instruments. 4,286,494, Cl. 84-309.000.
Jaquith, Hope: *See*—
Jaquith, Douglas, 4,286,494, Cl. 84-309.000.
Jarrett, Boaz A., to Lucas Industries Limited. Fuel injection systems. 4,286,930, Cl. 417-416.000.
Jaspert, Erhard: *See*—
Hentzschel, Erhard; Jaspert, Erhard; and Niederhoff, Kurt, 4,287,402, Cl. 219-61.500.
Javan, Ali, to Massachusetts Institute of Technology. Laser resonator cavities with wavelength tuning arrangements. 4,287,486, Cl. 331-94.50C.
Jenike & Johanson, Inc.: *See*—
Johanson, Jerry R., 4,286,883, Cl. 366-137.000.
Jenkins, Edwin E.: *See*—
Dwyer, Francis G.; and Jenkins, Edwin E., 4,287,166, Cl. 423-325.000.
Jensen, Deane E. Operational amplifier circuit. 4,287,479, Cl. 330-260.000.
Jersey Nuclear-Avco Isotopes, Inc.: *See*—
DeBaryshe, Paul G.; and Glickler, Sheldon L., 4,287,421, Cl. 250-423.00P.
Jinba, Terumasa: *See*—
Sato, Kunihiko; Urata, Tetsuro; Kawano, Mitsugi; Jinba, Terumasa; Kato, Yukio; and Uebayashi, Takeo, 4,287,403, Cl. 219-69.00M.
Jindou, Katsuya: *See*—
Hashimoto, Tadashi; and Jindou, Katsuya, 4,287,494, Cl. 333-202.000.
Johann Schaefer Kalkwerke: *See*—
von Zander, Hans, 4,287,160, Cl. 423-168.000.
Johanson, Jerry R., to Jenike & Johanson, Inc. Blending apparatus for bulk solids. 4,286,883, Cl. 366-137.000.
John D. Hollingsworth on Wheels, Inc.: *See*—
Harrison, John E., Sr., 4,286,357, Cl. 19-98.000.
Johna, Nobuo: *See*—
Miyajima, Nobuyuki; Johna, Nobuo; Mizushima, Naoki; and Ohbu, Kazuo, 4,287,102, Cl. 252-547.000.
Johnson, Bruce K., to Polaroid Corporation. Photographic camera apparatus for visually indicating the status of an exposure trim mechanism. 4,286,851, Cl. 354-53.000.
Johnson, Don R., to Harris & Thrush Manufacturing Company. Packer latch for module builder. 4,286,511, Cl. 100-35.000.
Johnson, Garland A.; and Peuler, Jacob D., to Upjohn Company, The. Method for preparing vanillin and composition therefor. 4,287,368, Cl. 568-436.000.
Johnson, Henry W., Jr., to Shell Oil Company. Viscosity measurement. 4,286,457, Cl. 73-53.000.
Johnson, James L.: *See*—
Taylor, Neil J.; St. Hilaire, A. Robert; and Johnson, James L., 4,286,409, Cl. 47-40.500.
Johnson & Johnson: *See*—
Trimmer, William S. N.; and Laser, Mark R., 4,286,459, Cl. 73-862.590.
Johnson & Johnson Products, Inc.: *See*—
Ring, David F., 4,286,595, Cl. 128-263.000.
Johnson, Marvin M.: *See*—
Tabler, Donald C.; and Johnson, Marvin M., 4,287,049, Cl. 208-180.000.
Johnson, Richard L.: *See*—
Klausmeier, William H.; Johnson, Richard L.; and Hirsch, Arnold L., 4,287,129, Cl. 260-397.100.
Johnson, Robert A., to Motorola Inc. Integrated universal RF joint and gimbal system. 4,287,497, Cl. 333-261.000.
Johnson, Russell W.: *See*—
Geiser, Edward M.; and Johnson, Russell W., 4,287,038, Cl. 204-158.00R.
Johnston, Barry. Closed loop solar collector system. 4,286,579, Cl. 126-438.000.
Jones, Cheryl D., to Minnesota Mining and Manufacturing Company. Controlled-rate liquid dispenser. 4,286,754, Cl. 239-6.000.
Jones, John E.; Fodor, William G.; Porter, James R.; and Edgell, James E., to Sandvik, Ind. Pedicure implement. 4,286,610, Cl. 132-76.400.
Jonville, Pierre: *See*—
Breda, Frederic; Jonville, Pierre; Bonomi, Angelo; and Ambert, Jack, 4,287,270, Cl. 429-103.000.
Jordan College: *See*—
Gates, Timothy P., 4,286,575, Cl. 126-422.000.
Jordan, John W.: *See*—
Finlayson, Claude M.; and Jordan, John W., 4,287,086, Cl. 252-316.000.
Jordy, Angelika; and Kapp, Wolfgang, to Degesch GmbH. Storage stable quickly acting tablets for combatting vertebrates preponderantly in underground structures. 4,287,171, Cl. 424-29.000.
Jossin, Alain: *See*—
Farge, Daniel; Jossin, Alain; Ponsinet, Gerard; and Reisdorf, Daniel, 4,287,197, Cl. 424-258.000.
Joulin, Gerard. Bran bread and method for making same. 4,287,215, Cl. 426-19.000.
Jovan, Inc.: *See*—
Miller, Aaron, 4,286,609, Cl. 132-75.000.
Judickas, Frank J. Ear piercing tool. 4,286,600, Cl. 128-330.000.
Judin, Evgeny A.: *See*—
Belsky, Arkady A.; Eljutin, Alexandr V.; Zubkov, Valery N.; Konjukov, Alexandr I.; Krasinskaya, Lidia I.; Nekrasova, Elena A.; Nizharadze, Konstantin S.; Markova, Larisa F.; Mirskaya, Mirra G.; Frolov, Alexei V.; and Judin, Evgeny A., 4,287,030, Cl. 204-105.00R.
Junike, Wilhelm: *See*—
Henneberg, Hasso; Hesse, Werner; and Junike, Wilhelm, 4,286,483, Cl. 82-2.00R.
Justus, Edgar J.; and Roerig, Arnold J., to Beloit Corporation. Extended nip press. 4,287,021, Cl. 162-358.000.
K.K. Elco International: *See*—
Yasutake, Kenichi; and Watanabe, Tetsuji, 4,286,837, Cl. 339-176.0MP.
Kabushiki Kaisha Ando Screen Seisakujo: *See*—
Ando, Seiya; and Inoue, Kozi, 4,287,064, Cl. 210-413.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Okuno, Noboru; Takeuchi, Takashi; Tsuzuku, Akihiko; Tanazawa, Masao; Nakajima, Minoru; and Imamura, Haruo, 4,286,935, Cl. 425-72.00R.
Kabushiki Kaisha Suwa Seikosha: *See*—
Numabe, Hitomi, 4,287,585, Cl. 368-82.000.
Takei, Katsumori; Kanbe, Sadao; and Shionozaki, Yoshio, 4,287,085, Cl. 252-299.630.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Matsunami, Muneharu; Kubota, Tatsushi; Yoshida, Akio; and Inokuchi, Nobuyuki, 4,286,805, Cl. 280-803.000.
Usami, Susumu; Hayashi, Yoshihiro; Nakaho, Junichi; and Yasumatsu, Jun, 4,286,759, Cl. 242-107.200.
Kacal, Gary W.; and Partridge, Charles C., to ACF Industries, Incorporated. High temperature ball valve. 4,286,614, Cl. 137-72.000.
Kadehjian, Leo J.; Sachdev, Harbans S.; and Snyder, Clinton D., to International Business Machines Corporation. Formulations for ink jet printing. 4,286,989, Cl. 106-22.000.
Kadyrov, Abduvasit: *See*—
Safaev, Abidzhan; Kadyrov, Abduvasit; Saidaliev, Zhakhongir G.; and Faiziev, Tulyagan F., 4,287,344, Cl. 546-164.000.
Kajitani, Makoto: *See*—
Fujmura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,287,207, Cl. 424-282.000.
Kaleskas, Edward W.: *See*—
Paradis, Joseph R.; and Kaleskas, Edward W., 4,286,628, Cl. 137-843.000.
Kamada, Kazumasa; Sasaki, Isao; and Kushi, Kenji, to Mitsubishi Rayon Co., Ltd. Coating composition and process for producing synthetic resin moldings by using the same. 4,287,227, Cl. 427-54.100.
Kamata, Shigeru, to Canon Kabushiki Kaisha. Zoom lens barrel capable of close up photography. 4,286,845, Cl. 350-430.000.
Kamiya, Fumio; Nodera, Hisatoshi; Ueda, Kenji; and Miyamoto, Hiroyuki, to Omron Tateisi Electronics Co. Proximity switching device. 4,287,440, Cl. 307-315.000.
Kamiyama, Hajime: *See*—
Inukai, Mitsuo; and Kamiyama, Hajime, 4,286,758, Cl. 242-107.000.
Kanamaru, Hitoshi, to Universal Pioneer Corporation. Automatic focus servomechanism in optical information reading device. 4,287,413, Cl. 369-45.000.
Kanbe, Sadao: *See*—
Takei, Katsumori; Kanbe, Sadao; and Shionozaki, Yoshio, 4,287,085, Cl. 252-299.630.
Kaneko, Akira; Ohya, Masaki; Suzuki, Masayasu; and Kobayashi, Akio, to Kureha Kagaku Kogyo Kabushiki Kaisha. Transparent resin composition for information signal recording discs. 4,287,316, Cl. 525-296.000.
Kansai Paint Co., Ltd.: *See*—
Tominaga, Akira; and Nishida, Reijiro, 4,287,041, Cl. 204-181.00C.
Kapitanov, Nikolai N.; Petrova, Natalia P.; and Ippolitov, Vladimir V. Forceps for isolation of part of blood vessel during anastomosis. 4,286,598, Cl. 128-303.00R.
Kapp, Wolfgang: *See*—
Jordy, Angelika; and Kapp, Wolfgang, 4,287,171, Cl. 424-29.000.
Kasei Optonix, Ltd.: *See*—
Ohmatoi, Susumu; Tanaka, Hitoshi; and Murakami, Seiji, 4,287,257, Cl. 428-403.000.
Kashiwagi, Atumi, to Fujimoto Photo Industrial Co., Ltd. Light source unit assembly for photographic enlarger. 4,286,867, Cl. 355-67.000.
Kasztreiner, Endre: *See*—
Kosa, Edit; Borvendeg, Janos; Huszti, Zsuzsanna; Kosary, Judit; Szilagyi, Geza; Tardos, Laszlo; Kasztreiner, Endre; Nagy, Las-

zlo; Szuucs, Erzsebet; and Kiss, Gabriella, 4,287,194, Cl. 424-248.510.

Katagiri, Shigenobu; Nakano, Hiroshige; and Matsuzaki, Kazuo, to Hitachi Koki Company Limited. Printer magnetic interference prevention system. 4,286,517, Cl. 101-93.140.

Kathawala, Faizulla G., to Sandoz, Inc. Carboxyl-(phenyl or tolyl)-sulfonium salts. 4,287,355, Cl. 560-18.000.

Kato, Yukio: *See*—
Sato, Kunihiko; Urata, Tetsuro; Kawano, Mitsugi; Jinba, Terumasa; Kato, Yukio; and Uebayashi, Takeo, 4,287,403, Cl. 219-69.00M.

Katz, Irving M., to Merck & Co., Inc. Contact lens wetting agents. 4,287,175, Cl. 424-78.000.

Kaufmann, John H., to Global Coatings Limited. Roof coating composition and construction. 4,287,241, Cl. 427-403.000.

Kawa, Hidetoshi; Mori, Kazuhiro; Watanabe, Kazuo; and Misawa, Yoshihiko, to Matsushita Electric Industrial Co., Ltd. Apparatus for detecting leads. 4,286,379, Cl. 29-705.000.

Kawabata, Hiroyuki: *See*—
Takeda, Mikio; Kishishita, Hiroshi; Kawabata, Hiroyuki; and Isaka, Kinichi, 4,287,449, Cl. 313-509.000.

Kawai Musical Instruments Mfg. Co., Ltd.: *See*—
Deutsch, Ralph, 4,286,491, Cl. 84-1.010.

Kawakami, Nidehiko; and Nishida, Jun. Electric circuit arrangements incorporating cathode ray tubes. 4,287,450, Cl. 315-14.000.

Kawamata, Mitsuo: *See*—
Nozawa, Ryoichiro; Amemiya, Yoichi; Kawamata, Mitsuo; Isohata, Shigeru; Sasaki, Takao; and Takekoshi, Yoshitaka, 4,287,460, Cl. 318-571.000.

Kawamatsu, Yutaka; and Fujita, Takeshi, to Takeda Chemical Industries, Ltd. Thiazolidine derivatives. 4,287,200, Cl. 424-270.000.

Kawamura, Masaharu: *See*—
Kiuchi, Masayoshi; and Kawamura, Masaharu, 4,286,858, Cl. 354-289.000.

Kawano, Mitsugi: *See*—
Sato, Kunihiko; Urata, Tetsuro; Kawano, Mitsugi; Jinba, Terumasa; Kato, Yukio; and Uebayashi, Takeo, 4,287,403, Cl. 219-69.00M.

Kawashima, Motozo: *See*—
Takeshima, Takahiko; Kawashima, Motozo; and Nishimoto, Masayuki, 4,286,648, Cl. 164-312.000.

Keatley, James, to Barry Wright Corporation. Isolation connection. 4,286,642, Cl. 411-112.000.

Keckeisen, Adelinde: *See*—
Zahner, Hans; Holst, Hartwig; Zoebelein, Gerhard; and Keckeisen, Adelinde, 4,287,186, Cl. 424-181.000.

Keeler Corporation: *See*—
Deshaw, Walter R., 4,286,841, Cl. 350-289.000.

Kees, Edward J.: *See*—
Steiger, Douglass W.; and Kees, Edward J., 4,286,651, Cl. 165-45.000.

Keim, Carroll R.: *See*—
Dahlberg, Bengt I.; Ehnstrom, Lars K. J.; and Keim, Carroll R., 4,287,303, Cl. 435-162.000.

Keim, John E.: *See*—
Lee, Maw H.; and Keim, John E., 4,287,464, Cl. 318-805.000.

Kellogg, Michael S., to Pfizer Inc. Derivatives of 6β-hydroxyalkylpenicillanic acids as β-lactamase inhibitors. 4,287,181, Cl. 424-114.000.

Kennecott Corporation: *See*—
McMurtry, Carl H.; Naum, Robert G.; Owens, Dean P.; and Hortman, Michael T., 4,287,145, Cl. 264-109.000.

Kerbleski, Joseph J.: *See*—
Tinney, Francis J.; Connor, David T.; Cetenko, Wiacześlaw A.; Kerbleski, Joseph J.; and Sorenson, Roderick J., 4,287,340, Cl. 544-250.000.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Menzenhauer, Paul, 4,286,725, Cl. 220-23.200.

Kerr Glass Manufacturing Corporation: *See*—
Herr, James E., 4,286,633, Cl. 141-24.000.

Kerwin, Daniel; and Trentadue, Victor, to Meyercord Co., The. Machine for applying indicia to tennis ball felts. 4,287,016, Cl. 156-497.000.

Kessinger, Orville E., Jr., to Caterpillar Tractor Co. Vehicle cross drive. 4,286,478, Cl. 74-705.000.

Kessler, William J., to Corporation for Public Broadcasting. Rejection filter to remove TV channel 6 and FM radio interference. 4,287,602, Cl. 455-286.000.

Kestner, Mark O.; and Stoldt, Stephen H., to Apollo Technologies, Inc. Method of improving the freeze resistance of particulate material at low temperatures. 4,287,236, Cl. 427-221.000.

Keuffel & Esser Company: *See*—
Erickson, Kent E., 4,286,871, Cl. 355-133.000.

Kida, Sueo: *See*—
Nakayama, Nobukazu; and Kida, Sueo, 4,287,308, Cl. 521-53.000.

Kiencke, Uwe: *See*—
Haubner, Georg; Wesemeyer, Jurgen; Schrumpf, Hans; Birmelin, Jorg; Schwab, Manfred; Honig, Gunter; Kiencke, Uwe; Schulz, Alfred; and Meier, Werner, 4,287,565, Cl. 364-580.000.

Kikuchi, Nobuaki: *See*—
Fujiwara, Shinobu; Furukawa, Kiyoshi; Kikuchi, Nobuaki; Iizawa, Osamu; Tanaka, Hitoshi; and Ueoka, Hisayoshi, 4,287,075, Cl. 106-39.500.

Kikuchi, Siro, to Nippon Asbestos Co., Ltd. Heat insulator for pipe lines. 4,287,245, Cl. 428-36.000.

Kikuta, Kazutsune; Tachibana, Masami; and Sato, Akihiro, to Chisso Corporation. Method for producing α-olefin polymers. 4,287,328, Cl. 526-115.000.

Kimura, Takeo: *See*—
Nonaka, Kohei; Koyama, Masahiro; Gonmori, Makoto; Kimura, Takeo; and Shiga, Tetsuo, 4,287,295, Cl. 430-349.000.

Kinergy Corporation: *See*—
Dumbaugh, George D.; and Wilson, Paul A., 4,287,056, Cl. 209-332.000.

King, Mary K.; and Boyd, William J. Disposable absorbent nonwoven structure. 4,287,251, Cl. 428-198.000.

Kirby, Charles R.; and McKay, Donald R., to Cominco Ltd. Process for the melting of sulfur. 4,286,966, Cl. 23-293.00S.

Kirchhoff, Bernhard, to O & K Orenstein & Koppel Aktiengesellschaft. Bottom plates for walking mechanisms, connected by means of connection pieces. 4,286,681, Cl. 180-8.00R.

Kishishita, Hiroshi: *See*—
Takeda, Mikio; Kishishita, Hiroshi; Kawabata, Hiroyuki; and Isaka, Kinichi, 4,287,449, Cl. 313-509.000.

Kiss, Gabriella: *See*—
Kosa, Edit; Borvendeg, Janos; Huszti, Zsuzsanna; Kosary, Judit; Szilagyi, Geza; Tardos, Laszlo; Kasztreiner, Endre; Nagy, Laszlo; Szuucs, Erzsebet; and Kiss, Gabriella, 4,287,194, Cl. 424-248.510.

Kitagawa, Yoshihiko; Hanamura, Yoshimi; Yuyama, Masahiro; Moritani, Masahiko; Sakuramoto, Akira; and Suzuki, Mikio, to Sumitomo Chemical Company, Limited. Continuous process for producing rubber-modified methyl methacrylate syrups. 4,287,317, Cl. 525-309.000.

Kitamura, Minoru: *See*—
Honda, Akira; Taguchi, Kiyomi; Hanmyo, Masayuki; Ishikawa, Masaru; and Kitamura, Minoru, 4,286,647, Cl. 164-153.000.

Kitik, Walter; Reder, Rodney; and Kurpiewski, Stanley, to Timex Corporation. Water-resistant rocker switch. 4,287,400, Cl. 200-302.000.

Kitzing, Rainer; Ficken, Geoffrey E.; and Dolden, Victor W., to Ciba-Geigy AG. Preparation of sulphoalkyl quaternary salts. 4,287,348, Cl. 548-121.000.

Kiuchi, Masayoshi; and Kawamura, Masaharu, to Canon Kabushiki Kaisha. Voltage detecting device for camera. 4,286,858, Cl. 354-289.000.

Kiwala, Jacob: *See*—
Sprecker, Mark A.; Trenkle, Robert W.; Mookherjee, Braja D.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; and Schmitt, Frederick L., 4,287,133, Cl. 260-458.00R.

Klappert, Ernst: *See*—
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Klausmeier, William H.; Johnson, Richard L.; and Hirsch, Arnold L., to Diamond Shamrock Corp. Synthesis of 1α-hydroxy-7-dehydrosteroids. 4,287,129, Cl. 260-397.100.

Klebe, Hans: *See*—
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Klein, Helmut: *See*—
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Klein, Jurgen: *See*—
Schulz, Peter; Vaupel, Knut; and Klein, Jurgen, 4,286,393, Cl. 34-57.00R.

Klein, Max. High efficiency particulate air filter. 4,286,977, Cl. 55-524.000.

Klein, Wilhelm: *See*—
Scherenberg, Hans O.; Breitschwerdt, Werner; Klein, Wilhelm; and Jahn, Walter, 4,286,359, Cl. 24-230.00R.

Kleinerman, Marcos. Dye lasers. 4,287,481, Cl. 331-94.50L.

Kleinewefers GmbH: *See*—
Lopata, Karl-Peter; and Tschirner, Wolfgang, 4,287,017, Cl. 156-583.500.

Kleinschmit, Peter; and Schwarz, Rudolf, to Degussa Aktiengesellschaft. Temperature stabilized, pyrogenically produced aluminum oxide-mixed oxide, the process for its production and use. 4,286,990, Cl. 106-73.400.

Kleinschmit, Peter: *See*—
Panster, Peter; Buder, Wolfgang; and Kleinschmit, Peter, 4,287,094, Cl. 252-431.00R.

Klemarczyk, Philip: *See*—
Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, 4,287,081, Cl. 252-174.110.

Klinkner, Hans-Guido: *See*—
Muller, Rudolf; Klinkner, Hans-Guido; and Culmann, Gunter, 4,286,994, Cl. 106-109.000.

Klomp, Edward D., to General Motors Corporation. Target injection stratified charge spark ignition engine. 4,286,557, Cl. 123-298.000.

Klotzer, Sieghart: *See*—
Vanassche, Willy J.; Pattyn, Herman A.; Moisar, Erik; and Klotzer, Sieghart, 4,287,296, Cl. 430-411.000.

Kneller, Eckhart; Koenig, Roland; Koester, Eberhard; Grau, Werner; and Mayer, Dieter, to BASF Aktiengesellschaft. Process of making a magnetic recording medium. 4,287,225, Cl. 427-48.000.

Knight, William E. Apparatus for attaching a load to two or more backpack frames. 4,286,740, Cl. 224-157.000.

Knoll, Randall L.: *See—*
Greer, Raymond T.; Vale, Bradley H.; and Knoll, Randall L., 4,286,341, Cl. 3-1.400.
Knox, Kenneth H.; Larkin, Mark E.; and Duffield, James R., to Abbott Laboratories. Tamperproof port cover. 4,286,640, Cl. 150-8.000.
Knox, Lloyd C.: *See—*
Streich, Steven G.; and Knox, Lloyd C., 4,286,629, Cl. 138-89.000.
Ko, Wen H.; and Hung, Chih P., to North American Manufacturing Company. Strip center line sensor. 4,287,471, Cl. 324-61.00R.
Kobayashi, Akio: *See—*
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Sagisaka, Yasuo; Kondo, Toshio; and Kobayashi, Akio, 4,286,560, Cl. 123-417.000.
Kobayashi, Kobee: *See—*
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Kobayashi, Shigeru: *See—*
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Kobayashi, Tadashi: *See—*
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Kober, Hans, to FAG Kugelfischer Georg Schafer & Co. Method of selecting rollers for high-speed journal bearings. 4,286,467, Cl. 73-460.000.
Kobzina, John W., to Chevron Research Company. Dichloroacyl diphenyl ether mite ovacides. 4,287,213, Cl. 424-331.000.
Koch, Klaus, to Hermann Berstorff Maschinenbau GmbH. Coal hydrogenating apparatus having means for sealing the rotary drive thereof. 4,287,157, Cl. 422-205.000.
Koch, Werner: *See—*
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Koester, Eberhard: *See—*
Kneller, Eckhart; Koenig, Roland; Koester, Eberhard; Grau, Werner; and Mayer, Dieter, 4,287,225, Cl. 427-48.000.
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Konian, Richard R.: *See—*
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Korus, Inc.: *See—*
Bang, Chang; and Row, Scott, 4,286,618, Cl. 137-408.000.
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Kress Corporation: *See—*
LaBerdia, William L., 4,286,915, Cl. 414-460.000.
Krieder, Robert D.: *See—*
Rudolph, Pamela; Krieder, Robert D.; and O'Keefe, Patrick J., Jr., 4,286,685, Cl. 180-176.000.
Kristiansen, Jan O.; and McCray, Walter A., to Foseco Trading A.G. Metallurgical pouring vessels. 4,286,773, Cl. 266-44.000.
Kruck, Peter: *See—*
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Kuesters, Werner; and Thil, Lucien, to BASF Aktiengesellschaft. Manufacture of symmetrical or unsymmetrical monoacetals of aromatic 1,2-diketones. 4,287,367, Cl. 568-43.000.
Kuhfuss, Herbert F.: *See—*
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Kuhn, Eberhard: *See—*
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Kuhn, J. Bruce; Utecht, Klaus P.; and Harris, Ronald K. Fishing lure retriever. 4,286,402, Cl. 43-17.200.
Kuhn, Rainer: *See—*
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Kulka, Kurt; Zazula, Teodosij; and Yurecko, John M., Jr., to Fritzsche Dodge & Olcott Inc. 1,2,3,6-Tetrahydrobenzyl alcohol esters and compositions containing the same. 4,287,100, Cl. 252-522.00R.

Kulprathipanja, Santi; and Neuzil, Richard W., to UOP Inc. Esterified aluminosilicate adsorbent as for resolution of sugar components. 4,287,001, Cl. 127-46.00B.

Kume, Tadashi; and Inoh, Isamu, to Honda Giken Kogyo Kabushiki Kaisha. Dialyzer apparatus in an artificial kidney system. 4,287,059, Cl. 210-188.000.

Kummer, Raymond B.: *See—*
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Kuosmanen, Vesa M. Efficiency heater. 4,286,570, Cl. 126-99.00R.

Kuphal, Wilko; and Wons, Heinz, to Siemens Aktiengesellschaft. Examination table for a urological X-ray examination apparatus. 4,287,422, Cl. 250-439.00R.

Kuraray Co., Ltd.: *See—*
Nakashima, Toshihide; Nakaji, Osamu; Takakura, Koichi; and Suzuki, Takayoshi, 4,287,177, Cl. 424-81.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
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Yusa, Haruhiko; Oota, Masanori; and Suzuki, Katumi, 4,287,312, Cl. 525-83.000.

Kurek, Clarence, to Enervest, Inc. Air pollution attenuation system for copiers employing noxious gas in a developing chamber through which the copy passes for development. 4,286,859, Cl. 354-300.000.

Kurpiewski, Stanley: *See—*
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Kushi, Kenji: *See—*
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Kuwabara, Kouji; Sugawara, Hiroyuki; Shirakura, Toshiharu; Sasaki, Kouji; and Takemori, Satoshi, to Hitachi, Ltd. Gas laser generating device of the longitudinal gas flow type. 4,287,487, Cl. 331-94.50G.

Kyokuto Electric Co., Ltd.: *See—*
Funahashi, Masao; and Maeda, Shigeru, 4,286,399, Cl. 40-124.100.

Labelon Corporation: *See—*
Marginean, Barry L., 4,287,264, Cl. 428-514.000.

Laber, Walter: *See—*
Moller, Friedrich-Wilhelm; Buchold, Henning; Klein, Helmut; Garkisch, Otto-Ludwig; Gutlhuber, Friedrich; and Laber, Walter, 4,287,375, Cl. 585-440.000.

LaBerdia, William L., to Kress Corporation. Straddle carrier. 4,286,915, Cl. 414-460.000.

Labofina S.A.: *See—*
Bracke, William J. I.; and Lanza, Emmanuel, 4,287,318, Cl. 525-313.000.

Laboratoires Hoechst, S.A.: *See—*
Simon, Pierre; and Dreux, Jacques, 4,287,206, Cl. 424-279.000.

Laborde, Martin: *See—*
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Labriot, Gilbert; Bitsch, Robert; Wattelle, Michel; and Lebesue, Jean, to Aluminium Pechiney; and Fives-Cail Babcock. Installations for the calcination of alumina and similar products. 4,286,944, Cl. 432-14.000.

Lacoste, Marvin. Apparatus for and method of freeze protecting plumbing. 4,286,613, Cl. 137-62.000.

Lacour, Alain P.: *See—*
Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Phillippe L., 4,287,351, Cl. 548-232.000.

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Lafaye, Jean-Jacques: *See—*
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Laimer, Friedrich, to Voest-Alpine Aktiengesellschaft. Arrangement of a steel-making plant for capturing and conducting away flue gases. 4,286,776, Cl. 266-158.000.

Lam, Hau C.; Lee, Thomas K. P.; and Cheng, Y. C., to International Quartz Ltd. Door knob alarm device. 4,287,513, Cl. 340-562.000.

Lambert, Gerald L.: *See—*
Sims, Larry A.; Lambert, Gerald L.; Gross, Raymond J.; and Collins, Harold B., 4,286,406, Cl. 46-72.000.

Lampka, Bruno. Partition-wall arrangement. 4,286,343, Cl. 4-596.000.

Landa, Benzion, to Savin Corporation. Method and apparatus for controlling the feed of projectiles in a microballisti printer. 4,286,886, Cl. 400-118.000.

Lang, Thomas: *See—*
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Langdon, William K.; and Lundsted, Lester G., to BASF Wyandotte Corporation. Surfactants derived from the reaction product of polyoxyalkylene polyols and polyglycidyl ethers and glycol-based antifreeze using same. 4,287,078, Cl. 252-76.000.

Langen, Peter. Feed pipe for conveying sticky bulk material. 4,286,702, Cl. 193-2.00R.

Langenstein & Schemann Aktiengesellschaft: *See—*
Bachmann, Horst, 4,286,454, Cl. 72-356.000.

Langer, Horst G.; and Brady, Thomas P., to Dow Chemical Company, The. Preparation of metal organopolyphosphate coordination of complexes. 4,287,131, Cl. 260-448.00R.

Langlois, Michel: *See—*
Bourgery, Guy R.; Douzon, Colette A.; Ancher, Jean-Francois R.; Lacour, Alain P.; Guerret, Patrick G.; Langlois, Michel; and Dostert, Phillippe L., 4,287,351, Cl. 548-232.000.

Langseth, Rollin E.; and Yeh, Yu S., to Bell Telephone Laboratories, Incorporated. Cooperating arrangement for diversity stations. 4,287,598, Cl. 455-52.000.

Lanza, Emmanuel: *See—*
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Larkin, Mark E.: *See—*
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Larsen, Gregory J., to FMC Corporation. Apparatus for separating liquid-solid mixtures. 4,287,058, Cl. 210-112.000.

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Trimmer, William S. N.; and Laser, Mark R., 4,286,459, Cl. 73-862.590.

Laser Precision Corporation: *See—*
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La Shomb, S. Donald: *See—*
Lemond, Phillip E.; La Shomb, S. Donald; and Rowe, Oliver R., Sr., 4,286,398, Cl. 37-2.00R.

Laska, Ronald C., to Pako Corporation. Photographic printer with automatic sensor calibration. 4,286,868, Cl. 355-68.000.

Lasoen, Jean J., to Massey-Ferguson Services N.V. Draft sensing apparatus. 4,286,669, Cl. 172-7.000.

Lathlaen, Richard A., to TRW, Inc. Method and means for coupling an elongated magnetic device. 4,287,573, Cl. 365-133.000.

Lathrop, Kim N. Swim goggles. 4,286,340, Cl. 2-430.000.

Lau, Kam Y.: *See—*
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Laughlin, Robert G., to Proctor & Gamble Company, The. Anti-ulcer composition. 4,287,174, Cl. 424-78.000.

Laurel Enterprises: *See—*
Skobel, Max, 4,286,360, Cl. 24-230.00R.

Laurent, Michel: *See—*
Vasseur, Jean-Pierre; Laurent, Michel; Loriau, Jean-Joseph; and Delhaute, Andre, 4,286,743, Cl. 228-124.000.

Laval, Emmanuel: *See—*
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Lazzari, Jean-Pierre, to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme). Magnetic data carrier for perpendicular recording. 4,287,544, Cl. 360-131.000.

Lebesue, Jean: *See—*
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le Bras, Bernard: *See—*
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Lechevallier, Christian; Cordier, Jacques; and Antoine, Martine, to Institut de Recherches de la Siderurgie Francaise. Cooled electrode adapted to contact molten metal. 4,287,045, Cl. 204-243.00R.

Leclerc, Pierre: *See—*
Huignard, Jean-Pierre; Leclerc, Pierre; Carballes, Jean-Claude; and Nappo, Armand, 4,286,838, Cl. 350-96.110.

Ledis, Stephen L.; Chastain, David L., Jr.; and Crews, Harold R., to Coulter Electronics, Inc. Differential lymphoid-myeloid determination of leukocytes in whole blood. 4,286,963, Cl. 23-230.00B.

Lee, Hong Man, to Champion International Corporation. Combination wood plastic railroad tie. 4,286,753, Cl. 238-37.000.

Lee, Maw H.; and Keim, John E., to Scott & Fetzer Company, The. Power factor controller for an induction motor using transistor switch means with variable breakdown voltage. 4,287,464, Cl. 318-805.000.

Lee, Thomas K. P.: *See—*
Lam, Hau C.; Lee, Thomas K. P.; and Cheng, Y. C., 4,287,513, Cl. 340-562.000.

Lee, Winston F. Z.; White, Raymond V.; and Sciulli, Felice M., to Rockwell International Corporation. Constant accuracy turbine meter. 4,286,471, Cl. 73-861.840.

Leech, Edward J., to Photocircuits Division of Kollmorgen Corp. Catalytic filler for electroless metallization of hole walls. 4,287,253, Cl. 428-323.000.

Legler, Bobby, to Dow Chemical Company, The. Filler mixtures and thermoset resins containing same. 4,287,115, Cl. 260-37.0EP.

Lehr, James R.; and Hsieh, Shuang-shii, to Tennessee Valley Authority. Beneficiation of high carbonate phosphate ores. 4,287,053, Cl. 209-167.000.

Leiber, Heinz, to Robert Bosch GmbH. Magnetic valve. 4,286,626, Cl. 137-625.650.

Leiber, Heinz, to Robert Bosch GmbH. Brake booster for the anti-wheel locking of a motor vehicle brake system. 4,286,826, Cl. 303-114.000.

Lemke, James U.: *See—*
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Lemkey, Franklin D.: *See*—
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Lemond, Phillip E.; La Shomb, S. Donald; and Rowe, Oliver R., Sr., to Rowe Corporation. Apparatus for excavating and transplanting trees and the like. 4,286,398, Cl. 37-2.00R.
Lenac, Vojko: *See*—
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Le Naour-Sene, Lyliane, to Essilor International "Cie Generale d'Optique". Process of integrating a photochromic substance into an ophthalmic lens and a photochromic lens of organic material. 4,286,957, Cl. 8-471.000.
Lenco, Inc.: *See*—
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Lentz, Robert A.: *See*—
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Leonard, Henri, to Micro Mega, S.A. Dental handpiece. 4,286,951, Cl. 433-126.000.
Lerebourg, Michel, to Etablissements DEMLER S.A. Method of manufacturing cementitious articles and various forms of equipment of putting this method into practice. 4,287,144, Cl. 264-79.000.
Lersmacher, Bernhard, to U.S. Philips Corporation. Device for solid-state pyrolysis of organic polymeric substances. 4,287,025, Cl. 202-222.000.
Lester, Robert W. Solid state music player using signals from a bubble-memory storage device. 4,287,568, Cl. 364-900.000.
Leuschner, Horst, to Motorola, Inc. MOS Bandgap reference. 4,287,439, Cl. 307-310.000.
Levin, Gary M. Paper clip. 4,286,358, Cl. 24-67.00R.
Levrai, Roland: *See*—
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Levy, Paul M. Television system. 4,287,528, Cl. 358-3.000.
Lew, Hyok S. Variable camber fluid power machine. 4,286,922, Cl. 416-17.000.
Lewis, Arlin C. Fuel additive injection device. 4,286,550, Cl. 123-25.00L.
Lewis, Richard B.: *See*—
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Lewis, Robert D., to Armstrong Cork Company. Fiber shrinking composition for nylon pile fabric. 4,286,955, Cl. 8-115.600.
Leybold-Heraeus GmbH: *See*—
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LFE Corporation: *See*—
Lynnworth, Lawrence C., 4,286,470, Cl. 73-861.180.
Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Borner, Manfred, 4,286,842, Cl. 350-331.00R.
Scholz, Werner, 4,287,491, Cl. 333-14.000.
Lienau, Mark H., to Sperry Corporation. High performance disk drive actuator. 4,287,445, Cl. 310-13.000.
Liesinger, James O. Hanger for slender articles. 4,286,717, Cl. 211-60.00T.
Lill, John F.; and Neff, Nelson E., to AMP Incorporated. Stator for stepper motor. 4,287,446, Cl. 310-71.000.
Limoncelli, Anthony F., to United Technologies Corporation. Tank cap. 4,286,727, Cl. 220-244.000.
Lin, Spencer B. T. Polypropylene endless loop and the method therefor. 4,286,429, Cl. 57-201.000.
Lindner, Alfred: *See*—
Brunner, Erwin; Schubert, Eckart; Lindner, Alfred; Merger, Franz; Volkamer, Klaus; Strohmeyer, Max; and Sandrock, Gerhard, 4,287,379, Cl. 585-839.000.
Lindner, Friedrich, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Roumfabert e.V. Method for charging or discharging a heat accumulator. 4,286,650, Cl. 165-1.000.
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Linetsky, Mikhail. Precast house manufacturing and erecting plant. 4,286,934, Cl. 425-62.000.
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Liptay, John S., to International Business Machines Corporation. Address formulation interlock mechanism. 4,287,561, Cl. 364-200.000.
Litehizer, Melvin P., Jr., to AMP Incorporated. Terminating tool. 4,286,381, Cl. 29-751.000.
Litton Systems, Inc.: *See*—
Benjamin, John W., 4,286,911, Cl. 414-273.000.
Liu, Thomas M. H.; Melillo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and Sletzinger, Meyer, to Merck & Co., Inc. Synthesis of thienamycin via (3SR, 4RS)-3-((RS)-1-acyloxyethyl)-2-oxo-4-azetidineacetate. 4,287,123, Cl. 260-239.00A.
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Loewy Robertson Engineering Co. Ltd.: *See*—
Houghton, Geoffrey, 4,286,448, Cl. 72-21.000.
Lohe, Konrad: *See*—
Hunger, Klaus; Klappert, Ernst; and Lohe, Konrad, 4,287,122, Cl. 260-203.000.
Lohmann, Wolfgang: *See*—
Baumann, Manfred; and Lohmann, Wolfgang, 4,286,515, Cl. 100-233.000.
Lomas, James W. Trailer. 4,286,800, Cl. 280-414.00B.
Long, Irvin E. Electro-mechanical displacement measuring device. 4,286,386, Cl. 33-138.000.
Longo, John M.: *See*—
Savage, David W.; Chang, Chin H.; and Longo, John M., 4,286,972, Cl. 55-58.000.
Lopata, Karl-Peter; and Tschirner, Wolfgang, to Kleinewefers GmbH. Endless pressing-on and guiding belt for textile treating devices, especially transfer printing machines and steaming calenders. 4,287,017, Cl. 156-583.500.
Lord Corporation: *See*—
McDowell, John R.; Howard, Dennis D.; and Pascarella, Vincent J., 4,287,083, Cl. 252-182.000.
L'Oreal: *See*—
Jacquet, Bernard; Papantoniou, Christos; and Mondet, Jean, 4,287,172, Cl. 424-47.000.
Loreto, Wilfredo P., to AIT Industries, Inc. Method of edging lenses. 4,286,415, Cl. 51-284.00E.
Loriau, Jean-Joseph: *See*—
Vasseur, Jean-Pierre; Laurent, Michel; Loriau, Jean-Joseph; and Delhaute, Andre, 4,286,743, Cl. 228-124.000.
Lovegrove, Paul D. Medical support board. 4,286,588, Cl. 128-133.000.
Lovichi, Jean P.; and le Bras, Bernard, to LaFarge Conseils et Etudes. Method and installation for making cement clinker. 4,286,993, Cl. 106-106.000.
Lu, Chin H.; and Erhardt, Peter F., to Xerox Corporation. Method of imagining using positive toners containing alkyl morpholinium compounds. 4,287,284, Cl. 430-120.000.
Lucas Industries Limited: *See*—
Jarrett, Boaz A., 4,286,930, Cl. 417-416.000.
May, William S., 4,286,566, Cl. 123-569.000.
Thomas, Alfred W.; and op den Camp, Lutz E. A., 4,286,501, Cl. 91-376.00R.
Luff, Marlin: *See*—
Skoda, William G.; and Luff, Marlin, 4,287,447, Cl. 310-348.000.
Lukensmeyer, Gene L.: *See*—
Hardesty, Keith C.; and Lukensmeyer, Gene L., 4,286,493, Cl. 84-237.000.
Lumsden, James R., to Universal Industrial Control Devices Ltd. High speed central office scanner. 4,287,567, Cl. 364-900.000.
Lund, Walter W., Jr.; Nalos, Ervin J.; and Skoumal, Donald E., to Boeing Company, The. Thermally compensated phase-stable waveguide. 4,287,495, Cl. 333-239.000.
Lundquist, Joseph T., Jr.; and Lundsager, Christian B., to W. R. Grace & Co. Alkaline battery with separator of high surface area. 4,287,276, Cl. 429-206.000.
Lundsager, Christian B.: *See*—
Lundquist, Joseph T., Jr.; and Lundsager, Christian B., 4,287,276, Cl. 429-206.000.
Lundsted, Lester G.: *See*—
Langdon, William K.; and Lundsted, Lester G., 4,287,078, Cl. 252-76.000.
Lunn, Eugene. Ship for lighter-than-water fluids. 4,286,535, Cl. 114-74.00R.
Lutes, George F., Jr.: *See*—
United States of America, National Aeronautics and Space Administration; Lutes, George F., Jr.; and Lau, Kam Y., 4,287,606, Cl. 455-617.000.
Lutz, Andre: *See*—
Heymes, Rene; and Lutz, Andre, 4,287,193, Cl. 424-246.000.
Luyckx, Leon A. Compositions and methods of production of alloy for treatment of liquid metals. 4,286,984, Cl. 75-58.000.
Lydtin, Hans J.: *See*—
Clasen, Rolf; and Lydtin, Hans J., 4,286,981, Cl. 65-169.000.
Lynnworth, Lawrence C., to LFE Corporation. Clamp-on ultrasonic transducer. 4,286,470, Cl. 73-861.180.
Lyons, Russell: *See*—
Zdarsky, Robert C.; and Lyons, Russell, 4,286,714, Cl. 206-526.000.
Lysle, Gordon; and Baur, Kenneth R., to Bell & Howell Company. Photoplastic film recording and monitoring apparatus. 4,286,864, Cl. 355-5.000.
MacDonald, J. G. Fraser, to Warner Electric Brake & Clutch Company. Amplifying clutch. 4,286,701, Cl. 192-18.00R.
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Okada, Toshio; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, to Japan Atomic Energy Research Inst.; and Yuasa Battery Co. Ltd. Cell separator and cell. 4,287,272, Cl. 429-144.000.
Mack, Kurt: *See*—
Reischl, Artur; Mack, Kurt; and Sahlmen, Friedhelm, 4,287,069, Cl. 210-609.000.
MacKenzie, Donald R. Hose clamp. 4,286,361, Cl. 24-276.000.

MacPherson, James A.; and Schwartz, Joseph, to Avant Modes, Inc. Picture frame and manufacture thereof. 4,286,400, Cl. 40-152.000.

Madsen, Gary: *See*—
Madsen, Gary J., 4,286,726, Cl. 220-220.000.

Madsen, Gary J., to Madsen, Gary; and Vargo, Ronald. Floating deck leg boots. 4,286,726, Cl. 220-220.000.

Maeda, Shigeru: *See*—
Funahashi, Masao; and Maeda, Shigeru, 4,286,399, Cl. 40-124.100.

Maeda, Toshiyuki: *See*—
Sakamaki, Hiroshi; Maeda, Toshiyuki; Ushijima, Fumihiro; and Saitou, Tadashi, 4,286,933, Cl. 418-15.000.

Maekawa, Naozane; and Awano, Takeshi, to Mitsubishi Jidasha Kogyo Kabushiki Kaisha. Seat-belt system. 4,286,804, Cl. 280-803.000.

Magana, Joseph. Freeze plug ejector and injector. 4,286,368, Cl. 29-267.000.

Magee, James: *See*—
Tauber, Thomas E.; and Magee, James, 4,286,464, Cl. 73-293.000.

Maggio, Karl F.: *See*—
Scheneman, Herbert T., Jr.; and Maggio, Karl F., 4,286,441, Cl. 64-30.00C.

Magnavox Company, The: *See*—
Borg, Arthur N.; Trostel, Jerry D.; and Heuer, Daniel A., 4,287,601, Cl. 455-186.000.

Maher, Maxine H. Quasi-octagonal pillow construction and method. 4,286,345, Cl. 5-434.000.

Maida, Osamu: *See*—
Hasegawa, Hiroshi; and Maida, Osamu, 4,287,549, Cl. 361-156.000.

Majoie, Bernard, to Societe de Recherches Industrielles (S.O.R.I.). Derivatives of phenoxyalkylcarboxylic acids. 4,28",209, Cl. 424-308.000.

Maklad, Nabil F.: *See*—
Ophir, Jonathan; Maklad, Nabil F.; and Jaeger, Paul M., 4,286,455, Cl. 73-1.0DV.

Malmsten, Sven O. Exhaust gas muffler. 4,286,689, Cl. 181-232.000.

Malouf, Edmond A., Jr. Shape retaining collar devices and articles of wearing apparel using same. 4,286,337, Cl. 2-116.000.

Maltby, Robert C.: *See*—
Maltby, Thomas F.; Maltby, Robert C.; and Wakefield, Alan W., 4,286,680, Cl. 177-208.000.

Maltby, Thomas F.; Maltby, Robert C.; and Wakefield, Alan W. Weighing apparatus. 4,286,680, Cl. 177-208.000.

Mameniskis, Walter A.; and Melpolder, Frank W., to Atlantic Richfield Company. Preparation of polyisocyanates from polycarbamates. 4,287,132, Cl. 260-453.00P.

Mamuzic, Rastko I.: *See*—
Garman, John A.; Mamuzic, Rastko I.; McDonald, Robert B.; Sands, John L.; and Thompson, Gregory, 4,287,373, Cl. 568-639.000.

Maney, Thomas P. Adjustable paper cap. 4,286,338, Cl. 2-197.000.

Mangano, Santi F., to I.B.P. Industrie Buitoni Perugina S.p.A. Chocolate confection containing carbonated hard candy crystals dispersed therein. 4,287,216, Cl. 426-93.000.

Manizza, Guelfo A., to Federal Paper Board Company, Inc. Bottle package. 4,286,709, Cl. 206-144.000.

Mannesmann AG.: *See*—
Hentzschel, Erhard; Jaspert, Erhard; and Niederhoff, Kurt, 4,287,402, Cl. 219-61.500.

Mannesmann Aktiengesellschaft: *See*—
Hackert, Karl-Heinz; and Blume, Helmut, 4,287,223, Cl. 427-9.000.

Manno, Joseph. Self-watering seed planter. 4,286,408, Cl. 47-27.000.

Marchais, Jean-Claude, to CIDELCEM. Cover for a standard container. 4,286,713, Cl. 206-508.000.

Marconi Company Limited, The: *See*—
Blount, Eric A., 4,286,380, Cl. 29-741.000.

Marer, Joseph, to Redon Trust. Device actuated electrically to trigger a mechanical percussion detonator. 4,286,521, Cl. 102-200.000.

Marginean, Barry L., to Labelon Corporation. Heat sensitive coating. 4,287,264, Cl. 428-514.000.

Margraf, Dallas A.: *See*—
Treiber, Fritz F.; and Margraf, Dallas A., 4,287,407, Cl. 219-273.000.

Markova, Larisa F.: *See*—
Belsky, Arkady A.; Eljutin, Alexandr V.; Zubkov, Valery N.; Konjukov, Alexandr I.; Krasinskaya, Lidia I.; Nekrasova, Elena A.; Nizharadze, Konstantin S.; Markova, Larisa F.; Mirskaya, Mirra G.; Frolov, Alexei V.; and Judin, Evgeny A., 4,287,030, Cl. 204-105.00R.

Marling, John B., to United States of America, Energy. Deuterium enrichment by selective photo-induced dissociation of an organic carbonyl compound. 4,287,037, Cl. 204-158.00R.

Marquis, Edward T.; Gipson, Robert M.; and Watts, Lewis W., Jr., to Texaco Inc. Molybdenum catalyst for aniline-formaldehyde condensation. 4,287,364, Cl. 564-332.000.

Marsch, Walter; and Werner, Hans, to BWZ Berg-und Industrietechnik GmbH. Device for positioning anchorage means. 4,286,482, Cl. 81-55.000.

Marsh, James M.: *See*—
Swift, William R.; Herrod, Don W.; and Marsh, James M., 4,287,564, Cl. 364-525.000.

Marshall, Lee. Pressure detection arrangement. 4,286,603, Cl. 128-782.000.

Martelli, Nerio; and Strazzari, Giuliano, to Nespak S.p.A. Societa Generale Per l'Imballaggio. Rectangular tray for packing and conveying spheroidal fruit. 4,286,715, Cl. 206-564.000.

Martin, Ernest N. Timer with reversible motor. 4,287,395, Cl. 200-33.00R.

Marzocchi, Alfred; Roberts, Michael G.; and Bolen, Charles E., to Owens-Corning Fiberglas Corporation. Bituminous composite reinforced with a filler coated with the reaction product of a bitumen and an organo metallic compound. 4,286,996, Cl. 106-282.000.

Marzocchi, Alfred; Roberts, Michael G.; and Bolen, Charles E., to Owens-Corning Fiberglas Corporation. Bituminous composite reinforced with a filler coated with the reaction product of a bitumen and a chromium complex. 4,286,997, Cl. 106-282.000.

Masaie, Kimio, to Murata Manufacturing Co., Ltd. Piezoelectric filter. 4,287,493, Cl. 333-191.000.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Neitz, Alfred; Pickel, Hans; and D'Alfonso, Nunzio, 4,286,556, Cl. 123-279.000.

Mashikian, Matthew S.: *See*—
Whittlesey, Curtis C.; and Mashikian, Matthew S., 4,287,267, Cl. 429-49.000.

Maslin, Raymond; and Linnhoff, Bodo, to Imperial Chemical Industries Limited. Hydrocarbon conversion. 4,287,377, Cl. 585-634.000.

Mason, Joseph E., to American Can Company. Dispensing apparatus for rolled sheet material. 4,286,488, Cl. 83-205.000.

Massachusetts General Hospital, The: *See*—
Young, David M., 4,287,184, Cl. 424-177.000.

Massachusetts Institute of Technology: *See*—
Flanders, Dale C., 4,287,235, Cl. 427-160.000.
Hsieh, Jaw J., 4,287,485, Cl. 331-94.50H.
Javan, Ali, 4,287,486, Cl. 331-94.50C.

Massey-Ferguson Services N.V.: *See*—
Lasoen, Jean J., 4,286,669, Cl. 172-7.000.

Matera, Giancarlo: *See*—
Cazzaro, Giorgio; Matera, Giancarlo; Cavallaro, Antonino; and Zani, Marina, 4,287,148, Cl. 264-182.000.

Matick, Richard E.: *See*—
Eardley, David B.; and Matick, Richard E., 4,287,575, Cl. 365-174.000.

Matsuda, Koji: *See*—
Carlsen, George C., II; Crumm, John C.; and Matsuda, Koji, 4,287,477, Cl. 330-255.000.

Matsui, Atsushi. Multipurpose floating structure. 4,286,538, Cl. 114-266.000.

Matsui, Toshikazu: *See*—
Matsumoto, Shoji; Matsui, Toshikazu; Ikeda, Toshimitsu; Kozuka, Nobuhiko; Nishihama, Hitoshi; and Aizawa, Tatsuo, 4,286,861, Cl. 355-3.00R.

Matsumoto, Masakazu; and Nishide, Katsuhiko, to Canon Kabushiki Kaisha. Hologram recording material. 4,287,277, Cl. 430-2.000.

Matsumoto, Shoji; Matsui, Toshikazu; Ikeda, Toshimitsu; Kozuka, Nobuhiko; Nishihama, Hitoshi; and Aizawa, Tatsuo, to Mita Industrial Company, Ltd. Electrostatic copying process and apparatus. 4,286,861, Cl. 355-3.00R.

Matsumoto Yushi-Seiyaku Co., Ltd.: *See*—
Nakayama, Nobukazu; and Kida, Sueo, 4,287,308, Cl. 521-53.000.

Matsunami, Muneharu; Kubota, Tatsushi; Yoshida, Akio; and Inokuchi, Nobuyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Tokai Rika Denki Seisakusho. Seatbelt system. 4,286,805, Cl. 280-803.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Funahashi, Masao; and Maeda, Shigeru, 4,286,399, Cl. 40-124.100.
Kawa, Hidetoshi; Mori, Kazuhiro; Watanabe, Kazuo; and Misawa, Yoshihiko, 4,286,379, Cl. 29-705.000.
Ueda, Kensaku, 4,287,500, Cl. 337-107.000.

Matsushita Electric Works, Ltd.: *See*—
Inoue, Hiromitsu; Ohashi, Hiroshi; and Kondo, Mikio, 4,287,579, Cl. 367-94.000.
Nakamura, Yoshimitsu; and Otada, Masami, 4,286,375, Cl. 29-597.000.

Matsuzaka, Eiichi: *See*—
Shimizu, Isoo; Tsuji, Okitsugu; Matsuzaka, Eiichi; and Sato, Atsushi, 4,287,376, Cl. 585-458.000.

Matsuzaki, Kazuo: *See*—
Katagiri, Shigenobu; Nakano, Hiroshige; and Matsuzaki, Kazuo, 4,286,517, Cl. 101-93.140.

Matsuzaki, Kiyoto; and Aya, Norimoto, to Nissan Motor Co., Ltd. Method and apparatus for forming bent plate glass. 4,286,980, Cl. 65-106.000.

Matta, Nagui R.: *See*—
Fahim, Magdi M.; Nowak, Victor J.; and Matta, Nagui R., 4,286,563, Cl. 123-469.000.

Mattel, Inc.: *See*—
Sims, Larry A.; Lambert, Gerald L.; Gross, Raymond J.; and Collins, Harold B., 4,286,406, Cl. 46-72.000.

Matthews, Paul E., to United States Bronze Powders, Inc. Composition for iron powder compact infiltrant. 4,286,987, Cl. 75-252.000.

Matumura, Masaaki: *See*—
Itoh, Kunio; Fukuda, Takeshi; and Matumura, Masaaki, 4,287,114, Cl. 260-37.0SB.

Maulat, Jean-Pierre: *See*—
Dehan, Gerard C. H.; and Maulat, Jean-Pierre, 4,286,473, Cl. 74-107.000.

May, William S., to Lucas Industries Limited. Engine system. 4,286,566, Cl. 123-569.000.

Mayer, Dieter: *See*—
Kneller, Eckhart; Koenig, Roland; Koester, Eberhard; Grau, Werner; and Mayer, Dieter, 4,287,225, Cl. 427-48.000.

Mayer, Ferdy. Differential transformer. 4,287,545, Cl. 361-44.000.

Maynard, Billy A.: *See*—
DeCaro, Aristide R.; Murphy, Eugene F.; and Maynard, Billy A., 4,287,231, Cl. 427-106.000.

Mays, James A. Kit for converting a rotary tiller into a plow. 4,286,671, Cl. 172-253.000.

Maytag Company, The: *See*—
Hunter, William H., 4,286,443, Cl. 68-12.00R.

Mazour, Zdenek, to Ciba-Geigy Corporation. Process for the preparation of O,O-dialkylthionophosphoric acid chlorides. 4,287,136, Cl. 260-985.000.

McArthur, Donald N.; and Heintz, Robert A., to General Motors Corporation. Method of folding an inflatable restraint cushion. 4,286,954, Cl. 493-244.000.

McArthur, William H. Solar energy absorbing panel. 4,286,578, Cl. 126-429.000.

McCall, John M., to Upjohn Company, The. Sulfooxy-pyrimidinium, -pyridinium, and -triazinium hydroxide inner salts. 4,287,338, Cl. 544-123.000.

McClain, Dorothee M., to National Distillers and Chemical Corp. Process of preparing finely divided thermoplastic resins. 4,287,333, Cl. 528-487.000.

McClelland, John F., to United States of America, Energy. Solar energy thermalization and storage device. 4,286,576, Cl. 126-428.000.

McCormick, Derek. Sprinkler system control valve and actuator device. 4,286,668, Cl. 169-22.000.

McCray, Walter A.: *See*—
Kristiansen, Jan O.; and McCray, Walter A., 4,286,773, Cl. 266-44.000.

McDonald, Robert B.: *See*—
Garman, John A.; Mamuzic, Rastko I.; McDonald, Robert B.; Sands, John L.; and Thompson, Gregory, 4,287,373, Cl. 568-639.000.

McDonnell Douglas Corporation: *See*—
Boehringer, Wilfred E., 4,286,927, Cl. 417-271.000.

McDowell, John R.; Howard, Dennis D.; and Pascarella, Vincent J., to Lord Corporation. Photoinitiation systems for free radical polymerization reactions. 4,287,083, Cl. 252-182.000.

McEntire, Edward E., to Texaco Inc. Preparation of N-(alkylaminoalkyl)acrylamides. 4,287,363, Cl. 564-205.000.

McGaughey, Donald C., to State Wide Aluminum of Indiana, Inc. Truck cover and door therefor. 4,286,820, Cl. 296-146.000.

McGrath, Neal. Electromagnetic shutter for lens. 4,286,856, Cl. 354-234.000.

McKay, Donald R.: *See*—
Kirby, Charles R.; and McKay, Donald R., 4,286,966, Cl. 23-293.00S.

McKnight, Joseph H. Floating corner for insertion into a packing container. 4,287,265, Cl. 428-542.000.

McLean, Douglas K., to Double-E Inc. Packing assembly for a movable shaft. 4,286,791, Cl. 277-64.000.

McMahon, Edward H., Jr.; and Abston, J. B., to Sonoco Products Company. Method for reverse printing on coated tube papers and tubes produced from the paper. 4,287,244, Cl. 428-35.000.

McMahon, James F., Jr., to Cleveland Controls, Incorporated. Trim execution device. 4,286,474, Cl. 74-522.000.

McMath, Jack A., to Dover Corporation. Automatic shut-off nozzle having an arrangement for controlling when automatic shut off occurs in response to pressure in a sealed tank. 4,286,635, Cl. 141-98.000.

McMurtry, Carl H.; Naum, Robert G.; Owens, Dean P.; and Hortman, Michael T., to Kennecott Corporation. Method for manufacturing neutron absorbing article. 4,287,145, Cl. 264-109.000.

McNeill, William H.: *See*—
Feuersanger, Alfred E.; Riseberg, Leslie A.; and McNeill, William H., 4,287,454, Cl. 315-178.000.

Measells, Paul E.: *See*—
Gajewski, Henry M.; Grode, Gerald A.; Measells, Paul E.; and Miripol, Jeffrey E., 4,286,597, Cl. 128-272.000.

Meckler, Gershon: *See*—
Westenhofer, Donald G.; and Meckler, Gershon, 4,286,667, Cl. 169-16.000.

Medcalf, Eugene C., to BWM Corporation. Hydrocarbon fuel additive. 4,286,969, Cl. 44-53.000.

Medtronic, Inc.: *See*—
Phillips, Gary M., 4,287,319, Cl. 525-336.000.

Meek, Nigel W.: *See*—
Caldwell, Godfrey P.; and Meek, Nigel W., 4,286,423, Cl. 56-6.000.

Mego Corp.: *See*—
Adickes, Cecil F., Jr.; and Berko, David R., 4,286,407, Cl. 46-163.000.

Mehesan, Thomas C., Jr., to Banner Industries, Inc. Boom mounted carrier for handling beef quarters and the like. 4,286,917, Cl. 414-704.000.

Meier, Werner: *See*—
Haubner, Georg; Wesemeyer, Jurgen; Schrumpf, Hans; Birmelin, Jorg; Schwab, Manfred; Honig, Gunter; Kiencke, Uwe; Schulz, Alfred; and Meier, Werner, 4,287,565, Cl. 364-580.000.

Mekosh, George, Jr.; and Hulse, David O., to Budd Company, The. Pin retracting mechanism for a trailer. 4,286,797, Cl. 280-80.00B.

Melillo, David G.: *See*—
Liu, Thomas M. H.; Melillo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and Sletzinger, Meyer, 4,287,123, Cl. 260-239.00A.

Melindo, Flavio, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Integrated circuitry for exchanging signals between telephone station and central office. 4,287,392, Cl. 179-16.0AA.

Melitz, Daniel T.; Searle, Kenneth L.; and Woodman, Brian E., to British Petroleum Company Limited, The. Diving structure and method of deployment of the structure. 4,286,896, Cl. 405-185.000.

Melpolder, Frank W.: *See*—
Mameniskis, Walter A.; and Melpolder, Frank W., 4,287,132, Cl. 260-453.00P.

Melroy, Patrick J.: *See*—
Spencer, Donald L.; and Melroy, Patrick J., 4,286,577, Cl. 126-429.000.

Mem Muszaki Intezet: *See*—
Fabian, Zsolt; Samu, Mihaly; and Balogh, Barnabas, 4,287,470, Cl. 324-61.00R.

Mente, Hans-Peter: *See*—
Baumann, Erich; Mente, Hans-Peter; and Muller, Wolfgang, 4,286,479, Cl. 74-724.000.

Menzenhauer, Paul, to Kernforschungszentrum Karlsruhe GmbH. Vessel for collecting and extinguishing combustible liquids. 4,286,725, Cl. 220-23.200.

Menzies, James D., to Simonacco Limited. Device for driving an endless chain. 4,286,707, Cl. 198-859.000.

Merck & Co., Inc.: *See*—
Carlo, Dennis J.; Jackson, Jesse J.; and Stoudt, Thomas H., 4,287,173, Cl. 424-49.000.
Katz, Irving M., 4,287,175, Cl. 424-78.000.
Liu, Thomas M. H.; Melillo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and Sletzinger, Meyer, 4,287,123, Cl. 260-239.00A.
Olson, George; Tolman, Richard L.; and Weppelman, Roger M., 4,287,201, Cl. 424-273.00R.

Merger, Franz: *See*—
Brunner, Erwin; Schubert, Eckart; Lindner, Alfred; Merger, Franz; Volkamer, Klaus; Strohmeyer, Max; and Sandrock, Gerhard, 4,287,379, Cl. 585-839.000.

Merten, Gerhard; Peters, Wolfgang; Schneider, Hans-Dieter; and Heyer, Willy, to Gewerkschaft Eisenhutte Westfalia. Conveyor and guide assembly. 4,286,823, Cl. 299-43.000.

Merten, Josef: *See*—
Grigo, Ulrich; Morbitzer, Leo; Arlt, Klaus-Peter; Binsack, Rudolf; and Merten, Josef, 4,287,108, Cl. 260-29.1SB.

Metalfab Industries, Inc.: *See*—
Wylie, William H., 4,286,813, Cl. 292-251.000.

Metallgesellschaft Aktiengesellschaft: *See*—
Moller, Friedrich-Wilhelm; Buchold, Henning; Klein, Helmut; Garkisch, Otto-Ludwig; Gutlhuber, Friedrich; and Laber, Walter, 4,287,375, Cl. 585-440.000.
Schminke, Heinz; and Schindling, Josef, 4,286,974, Cl. 55-126.000.

Metallurgical International, Inc.: *See*—
Bewley, James G., 4,287,068, Cl. 210-510.000.

Mettler, Stephen C.: *See*—
Buckler, Michael J.; Kummer, Raymond B.; Mettler, Stephen C.; and Miller, Calvin M., 4,286,979, Cl. 65-3.00A.

Meyer, Rolf-Volker; Dhein, Rolf; and Fahnler, Friedrich. Polyamide blends. 4,287,315, Cl. 525-183.000.

Meyer, Rudolf, to Agfa-Gevaert Aktiengesellschaft. Apparatus and a method for recording information. 4,287,522, Cl. 346-75.000.

Meyercord Co., The: *See*—
Kerwin, Daniel; and Trentadue, Victor, 4,287,016, Cl. 156-497.000.

Meyerhoff, Albert J.: *See*—
Paulish, Daniel J.; Meyerhoff, Albert J.; and Nickett, George R., 4,287,592, Cl. 370-88.000.

Meyerle, Michael; Anton, Otto; and Ehrlinger, Friedrich, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Steplessly adjustable variable-speed hydrostatic-mechanical composite transmission. 4,286,477, Cl. 74-687.000.

Meyers, Charles, to Te Ka De Felten & Guilleaume Fernmeldeanlagen GmbH. Adaptive delta-modulation network. 4,287,595, Cl. 375-28.000.

Michaels, Glenn O.; and Spangler, Michael J., to Standard Oil Company (Indiana). Process for controlling polymer particle size in vapor phase polymerization. 4,287,327, Cl. 526-86.000.

Micheli, Adolph L., to General Motors Corporation. Process for producing a body of sintered TiO_2 for resistive gas sensor. 4,286,378, Cl. 29-621.000.

Michigan Consolidated Gas Company: *See*—
Agrawal, Jagdish M., 4,287,161, Cl. 423-229.000.

Mickleson, Lee, to Discovision Associates. Reproducing objective lens for videodiscs. 4,286,848, Cl. 350-467.000.

Micro Mega, S.A.: *See*—
Leonard, Henri, 4,286,951, Cl. 433-126.000.

Midgley, John A.; and Nyberg, David D., to Raychem Corporation. Recoverable articles. 4,287,012, Cl. 156-86.000.

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Grachev, Vladimir V.; Chepurin, Valentin M.; Mikhailov, Viktor Y.; and Rybnikov, Sergei I., 4,286,450, Cl. 72-59.000.
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Buckler, Michael J.; Kummer, Raymond B.; Mettler, Stephen C.; and Miller, Calvin M., 4,286,979, Cl. 65-3.00A.
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Milstead, Charles W.; and Ridenour, Larry. Protective flexible sealed enclosure for a steerable drive wheel of a vehicle. 4,286,794, Cl. 277-212.0FB.
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Kolb, Robert E., 4,287,320, Cl. 525-340.000.
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Akamatsu, Masahiko, 4,287,434, Cl. 307-253.000.
Ohnishi, Masaru; and Samejima, Kazuhiro, 4,287,524, Cl. 346-154.000.
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Murphy, Jeannie P. Thin wallet carrying case for a sanitary napkin or tampon. 4,286,639, Cl. 150-7.000.
Musgrove, Robert G., to Vought Corporation. Eccentric actuator. 4,286,761, Cl. 244-75.00R.
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Nakamura, Hiroya; and Nishida, Yasunide, to Konishiroku Photo Industry Co., Ltd. Transmission-reception apparatus. 4,287,589, Cl. 370-31.000.
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Neal, William; and Neal, Mary. Folding tent. 4,286,612, Cl. 135-4.00R.
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Neitz, Alfred; Pickel, Hans; and D'Alfonso, Nunzio, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Arrangement for air-compressing direct-injection internal combustion engines. 4,286,556, Cl. 123-279.000.
Nekrasova, Elena A.: *See—*
Belsky, Arkady A.; Eljutin, Alexandr V.; Zubkov, Valery N.; Konjukov, Alexandr I.; Krasinskaya, Lidia I.; Nekrasova, Elena A.; Nizharadze, Konstantin S.; Markova, Larisa F.; Mirskaya, Mirra G.; Frolov, Alexei V.; and Judin, Evgeny A., 4,287,030, Cl. 204-105.00R.
Nelson, Robert T.: *See—*
Shelton, John J., 4,286,417, Cl. 51-415.000.
Nespak S.p.A. Societa Generale Per l'Imballaggio: *See—*
Martelli, Nerio; and Strazzari, Giuliano, 4,286,715, Cl. 206-564.000.
Neutjens, Gustaaf W. T.: *See—*
Boute, Raymond T. G.; De Kinder, Wilfried L. J.; Neutjens, Gustaaf W. T.; Pochet, Andre G. G.; Vanderschoot, Jan P. M.; and Van Remortel, Jacques D. A., 4,287,590, Cl. 370-59.000.
Neuzil, Richard W.: *See—*
Kulprathipanja, Santi; and Neuzil, Richard W., 4,287,001, Cl. 127-46.00B.
Nevins, Robert L. Prevention of thermal buildup by controlled exterior means and solar energy collectors. 4,286,582, Cl. 126-446.000.
Newbauer, Robert E.; and Niemann, Gunther B. Animal restraint unit. 4,286,547, Cl. 119-96.000.
Newcomb, Nelson F.; and Newcomb, Nelson F., Jr. Practice baseball. 4,286,783, Cl. 273-26.00R.
Newcomb, Nelson F., Jr.: *See—*
Newcomb, Nelson F.; and Newcomb, Nelson F., Jr., 4,286,783, Cl. 273-26.00R.
Newkirk, Lawrence R.: *See—*
Riley, Robert E.; Newkirk, Lawrence R.; Valencia, Flavio A.; and Wallace, Sr., Terry C., 4,287,259, Cl. 428-408.000.
Nguyen, Jean-Paul; Laval, Emmanuel; and Cendre, Andre, to Institut Francais du Petrole. Crank connector for directional drilling. 4,286,676, Cl. 175-74.000.
Nickel, Herbert W., to A. O. Smith Corporation. Water heater heat trap assembly. 4,286,573, Cl. 126-362.000.
Nickerson, James H. D.: *See—*
Ruhe, Anthony; and Nickerson, James H. D., 4,286,654, Cl. 165-172.000.
Nickett, George R.: *See—*
Paulish, Daniel J.; Meyerhoff, Albert J.; and Nickett, George R., 4,287,592, Cl. 370-88.000.
Nickmeyer, Walter V., to Amark Industries, Inc. Cartridge heater structure. 4,287,502, Cl. 338-274.000.
Nicks, Larry J.: *See—*
Atkinson, Gary B.; Nicks, Larry J.; and Bauer, Donald J., 4,287,095, Cl. 252-443.000.
Niederhoff, Kurt: *See—*
Hentzschel, Erhard; Jaspert, Erhard; and Niederhoff, Kurt, 4,287,402, Cl. 219-61.500.
Nielsen, Willi G., to Gottlieb Commercial Company A/S. Mat for multispectral camouflage of objects and permanent constructions. 4,287,243, Cl. 428-17.000.
Niemann, Gunther B.: *See—*
Newbauer, Robert E.; and Niemann, Gunther B., 4,286,547, Cl. 119-96.000.
Nihon Medi-Physics Co., Ltd.: *See—*
Yokoyama, Akira; and Arano, Yasushi, 4,287,362, Cl. 562-556.000.
Ninomiya, Youichi; and Tsuno, Kazuhiko. Check valve assembly. 4,286,622, Cl. 137-533.110.
Nippon Asbestos Co., Ltd.: *See—*
Kikuchi, Siro, 4,287,245, Cl. 428-36.000.
Nippon Electric Co., Ltd.: *See—*
Fukaya, Hirokazu; and Shoji, Masashi, 4,287,390, Cl. 179-1.00A.
Nishitani, Takao, 4,287,558, Cl. 364-200.000.
Sakuma, Hiraku, 4,287,526, Cl. 357-23.000.
Nippon Kogaku K.K.: *See—*
Hasegawa, Hiroshi, 4,286,855, Cl. 354-234.000.
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Nippon Kokan Kabushiki Kaisha: *See—*
Honda, Akira; Taguchi, Kiyomi; Hanmyo, Masayuki; Ishikawa, Masaru; and Kitamura, Minoru, 4,286,647, Cl. 164-153.000.
Sato, Kunihiko; Urata, Tetsuro; Kawano, Mitsugi; Jinba, Terumasa; Kato, Yukio; and Uebayashi, Takeo, 4,287,403, Cl. 219-69.00M.
Nippon Paint Co., Ltd.: *See—*
Murakami, Ryoichi; Shimizu, Hideo; and Sato, Syuzi, 4,287,004, Cl. 148-6.15R.
Nippon Petrochemicals Co., Ltd.: *See—*
Shimizu, Isoo; Tsuji, Okitsugu; Matsuzaka, Eiichi; and Sato, Atsushi, 4,287,376, Cl. 585-458.000.
Nippon Steel Corporation: *See—*
Hiromae, Yoshitaka; Nakamura, Kazuo; and Nitto, Hajime, 4,287,006, Cl. 148-27.000.
Nippon Wiper Blade Co., Ltd.: *See—*
Ichise, Yoshiju, 4,286,350, Cl. 15-250.320.
Nippondenso Co., Ltd.: *See—*
Nagano, Shojiro; Naganuma, Naohiro; and Ito, Mikiji, 4,286,932, Cl. 417-526.000.
Sagisaka, Yasuo; Kondo, Toshio; and Kobayashi, Akio, 4,286,560, Cl. 123-417.000.
Yasui, Toshio; and Naito, Motoharu, 4,287,431, Cl. 307-10.00R.
Nishida, Jun: *See—*
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Nishida, Reijiro: *See—*
Tominaga, Akira; and Nishida, Reijiro, 4,287,041, Cl. 204-181.00C.
Nishida, Yasuhide: *See—*
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Nishide, Katsuhiko: *See—*
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Nishihama, Hitoshi: *See—*
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Nishimoto, Masayuki: *See—*
Takeshima, Takahiko; Kawashima, Motozo; and Nishimoto, Masayuki, 4,286,648, Cl. 164-312.000.
Nishimura, Takeo: *See—*
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Nishimura, Toshio: *See—*
Watanabe, Minoru; Oikawa, Mitsuhiro; Nishimura, Toshio; Asada, Masao; Tezuka, Masao; and Cho, Tsurahide, 4,287,229, Cl. 427-64.000.
Nishio, Hiroshi; Fukano, Kazuaki; Amano, Isao; and Okumura, Osamu, to Lion Fat & Oil Co., Ltd., The. Enzyme-containing detergent composition. 4,287,101, Cl. 252-537.000.
Nishitani, Takao, to Nippon Electric Co., Ltd. Sampled data processing system having memory with areas alternately dedicated to data I/O and data processing. 4,287,558, Cl. 364-200.000.
Nissan Motor Co., Ltd.: *See—*
Matsuzaki, Kiyoto; and Aya, Norimoto, 4,286,980, Cl. 65-106.000.
Tominaga, Tamotsu; Mihara, Teruyoshi; Oguro, Takeshi; and Takeuchi, Masami, 4,287,501, Cl. 338-42.000.
Tsutsumi, Saburo, 4,286,552, Cl. 123-48.0AA.
Tsutsumi, Saburo, 4,286,561, Cl. 123-432.000.
Yanagida, Toshio, 4,286,506, Cl. 98-2.000.
Nitto, Hajime: *See—*
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Nizharadze, Konstantin S.: *See—*
Belsky, Arkady A.; Eljutin, Alexandr V.; Zubkov, Valery N.; Konjukov, Alexandr I.; Krasinskaya, Lidia I.; Nekrasova, Elena A.; Nizharadze, Konstantin S.; Markova, Larisa F.; Mirskaya, Mirra G.; Frolov, Alexei V.; and Judin, Evgeny A., 4,287,030, Cl. 204-105.00R.
NL Industries, Inc.: *See—*
Finlayson, Claude M.; and Jordan, John W., 4,287,086, Cl. 252-316.000.
Noble, Charles M.; and Olthoff, James A., to Caterpillar Tractor Co. Replaceable bearing assembly for construction vehicles. 4,286,674, Cl. 172-811.000.
Nodera, Hisatoshi: *See—*
Kamiya, Fumio; Nodera, Hisatoshi; Ueda, Kenji; and Miyamoto, Hiroyuki, 4,287,440, Cl. 307-315.000.
Nolte, Margaretha J.: *See—*
Coetzer, Johan; Nolte, Margaretha J.; and de Kocknee Steynberg, Annemare, 4,287,271, Cl. 429-103.000.
Nonaka, Kohei; Koyama, Masahiro; Gonmori, Makoto; Kimura, Takeo; and Shiga, Tetsuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Image forming method and apparatus therefor. 4,287,295, Cl. 430-349.000.
Nordischer Maschinenbau Rud. Baader GmbH & Co. KG: *See—*
Braeger, Horst K. H., 4,286,355, Cl. 17-46.000.
Norris, Philip R., to Polaroid Corporation. Microfiche camera having motor control system. 4,286,853, Cl. 354-123.000.
North American Manufacturing Company: *See—*
Ko, Wen H.; and Hung, Chih P., 4,287,471, Cl. 324-61.00R.
North, Robert A., to Boots Company, The. Process for the production of fluoronitrobenzenes. 4,287,374, Cl. 568-937.000.

Northern Telecom Inc.: *See*—
Adams, William J.; Moorse, Jeffrey W.; and Haskins, Steve W., 4,286,835, Cl. 339-17.00F.
Norton Simon, Inc.: *See*—
Fukuoka, Kazuaki, 4,286,745, Cl. 229-4.500.
Nosker, Richard W.: *See*—
Simshauser, Elvin D.; and Nosker, Richard W., 4,287,587, Cl. 369-50.000.
Novak, Milan; and Adams, William F., to Canada, Her Majesty the Queen in right of, as represented by the Minister of Natural Resources. Trap construction. 4,286,404, Cl. 43-87.000.
Novatome: *See*—
Deshais, Richard; and Carbonnel, Henri, 4,286,926, Cl. 417-50.000.
Nowak, Victor J.: *See*—
Fahim, Magdi M.; Nowak, Victor J.; and Matta, Nagui R., 4,286,563, Cl. 123-469.000.
Nozawa, Ryoichiro; Amemiya, Yoichi; Kawamata, Mitsuo; Isohata, Shigeru; Sasaki, Takao; and Takekoshi, Yoshitaka, to Fujitsu Fanuc Limited. Positioning control system. 4,287,460, Cl. 318-571.000.
Numabe, Hitomi, to Kabushiki Kaisha Suwa Seikosha. Chronograph wristwatch. 4,287,585, Cl. 368-82.000.
Nyberg, David D.: *See*—
Midgley, John A.; and Nyberg, David D., 4,287,012, Cl. 156-86.000.
Nypro, Inc.: *See*—
Paradis, Joseph R.; and Kaleskas, Edward W., 4,286,628, Cl. 137-843.000.
O & K Orenstein & Koppel Aktiengesellschaft: *See*—
Kirchhoff, Bernhard, 4,286,681, Cl. 180-8.00R.
O'Boyle, Matthew: *See*—
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Occidental Research Corporation: *See*—
DiGiacomo, Peter M., 4,287,071, Cl. 210-643.000.
O'Connor, Thomas R., to Eastman Kodak Company. Coating apparatus provided with a protective shield. 4,287,240, Cl. 427-402.000.
Oda, Kazuo: *See*—
Monden, Takeshi; Shiba, Yoshiro; Momonaka, Toshihiro; Kobayashi, Shigeru; and Oda, Kazuo, 4,287,242, Cl. 427-426.000.
Ogawa, Mototuga, to Olympus Optical Co., Ltd. Bend angle control for endoscope. 4,286,585, Cl. 128-6.000.
Ogihara, Masuo; Chimura, Kozo; Shinozaki, Nobuo; and Seki, Yoichi, to Seiko Koki Kabushki Kaisha. Signaling time detecting device for leaf type digital clock. 4,287,586, Cl. 368-222.000.
Ogle, Robert W., to IMS Limited. Apparatus and method for lyophilizing aseptic substances. 4,286,389, Cl. 34-5.000.
Oguma, Tomio, to Aisin Seiki Kabushiki Kaisha. Automatic fluid mixing valves. 4,286,749, Cl. 236-12.00A.
Oguro, Takeshi: *See*—
Tominaga, Tamotsu; Mihara, Teruyoshi; Oguro, Takeshi; and Takeuchi, Masami, 4,287,501, Cl. 338-42.000.
Ohashi, Hiroshi: *See*—
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Ohba, Hideo: *See*—
Ohta, Tatsuo; Shinozaki, Sohji; Yoshida, Syûsaku; and Ohba, Hideo, 4,287,278, Cl. 430-53.000.
Ohbu, Kazuo: *See*—
Miyajima, Nobuyuki; Johna, Nobuo; Mizushima, Naoki; and Ohbu, Kazuo, 4,287,102, Cl. 252-547.000.
Ohlinger, Manfred: *See*—
Rudolf, Peter; Steck, Werner; Koester, Eberhard; Ohlinger, Manfred; and Jaeckh, Christof, 4,287,233, Cl. 427-127.000.
Ohmae, Takashi; Fukaya, Yasuhiro; Yoshida, Yasuyuki; Oka, Tamotu; Sato, Masahiko; and Nagareda, Masazumi, to Mitsubishi Jukogyo Kabushiki Kaisha. Process and apparatus for exhausting fumes produced by arc welding. 4,287,405, Cl. 219-136.000.
Ohmatoi, Susumu; Tanaka, Hitoshi; and Murakami, Seiji, to Kasei Optonix, Ltd. Phosphors for color televisions. 4,287,257, Cl. 428-403.000.
Ohminato, Mitsuru: *See*—
Satomi, Toyokazu; Ohminato, Mitsuru; and Tabata, Yasuhiro, 4,286,865, Cl. 355-14.0CU.
Ohmori, Taiji; Sato, Makoto; and Tsuchiya, Yoshikazu, to Honda Giken Kogyo Kabushiki Kaisha. Trouble diagnosing device of control circuit system. 4,287,505, Cl. 340-52.00B.
Ohnishi, Masaru; and Samejima, Kazuhiro, to Mitsubishi Denki Kabushiki Kaisha. Electrostatic recording method with delayed control voltage. 4,287,524, Cl. 346-154.000.
Ohnuma, Teruyuki; Miyakawa, Seiichi; and Oyama, Hajime, to Ricoh Company, Ltd. Apparatus for developing electrostatic image. 4,286,543, Cl. 118-657.000.
Ohta, Tatsuo; Shinozaki, Sohji; Yoshida, Syusaku; and Ohba, Hideo, to Konishiroku Photo Industry Co., Ltd. Two superimposed ion current formed images using photoconductive screen gives wider potential range for gradation control in electrophotography. 4,287,278, Cl. 430-53.000.
Ohtsu Tire & Rubber Co., Ltd., The: *See*—
Fuzioka, Keizi; and Shinomiya, Masami, 4,286,942, Cl. 425-577.000.
Ohya, Masaki: *See*—
Kaneko, Akira; Ohya, Masaki; Suzuki, Masayasu; and Kobayashi, Akio, 4,287,316, Cl. 525-296.000.
Ohyama, Kunio: *See*—
Kotani, Kikuo; Ohyama, Kunio; Nakagawa, Nobuaki; Fujii, Tadashiro; and Watanabe, Susumu, 4,287,345, Cl. 546-261.000.
Oikawa, Mitsuhiro: *See*—
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Oka, Tamotu: *See*—
Ohmae, Takashi; Fukaya, Yasuhiro; Yoshida, Yasuyuki; Oka, Tamotu; Sato, Masahiko; and Nagareda, Masazumi, 4,287,405, Cl. 219-136.000.
Okada, Toshio: *See*—
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Okamoto, Takamitsu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Intake system of an internal combustion engine. 4,286,554, Cl. 123-188.00M.
Okamoto, Tsugio: *See*—
Hisakawa, Minoru; and Okamoto, Tsugio, 4,286,887, Cl. 400-196.100.
Okano, Shigeru: *See*—
Fujiu, Takahiro; Nakajima, Masao; and Okano, Shigeru, 4,286,958, Cl. 8-471.000.
O'Keefe, Patrick J., Jr.: *See*—
Rudolph, Pamela; Krieder, Robert D.; and O'Keefe, Patrick J., Jr., 4,286,685, Cl. 180-176.000.
Okuda, Hiroshi, to Sony Corporation. Recording and reproducing device. 4,287,542, Cl. 360-105.000.
Okumura, Osamu: *See*—
Nishio, Hiroshi; Fukano, Kazuaki; Amano, Isao; and Okumura, Osamu, 4,287,101, Cl. 252-537.000.
Okuno, Noboru; Takeuchi, Takashi; Tsuzuku, Akihiko; Tanazawa, Masao; Nakajima, Minoru; and Imamura, Haruo, to Kabushiki Kaisha Komatsu Seisakusho. Earth and sand conveyor system. 4,286,935, Cl. 425-72.00R.
Olander, Walter K., to General Electric Company. Poly(phenylene ether)poly(vinyl aromatic) compositions. 4,287,321, Cl. 525-392.000.
Olin Corporation: *See*—
Gullotti, Damian V.; Damon, Lloyd E.; Chatfield, Phillip A.; and Winter, Joseph, 4,286,744, Cl. 228-125.000.
Harris, Frederick J., 4,286,496, Cl. 411-441.000.
Oliver, Robert G.: *See*—
Houle, Philip J.; and Oliver, Robert G., 4,286,907, Cl. 414-72.000.
Olson, George; Tolman, Richard L.; and Weppelman, Roger M., to Merck & Co., Inc. Anovulatory method and chicken feed compositions. 4,287,201, Cl. 424-273.00R.
Olthoff, James A.: *See*—
Noble, Charles M.; and Olthoff, James A., 4,286,674, Cl. 172-811.000.
Olympus Optical Co., Ltd.: *See*—
Ogawa, Mototuga, 4,286,585, Cl. 128-6.000.
O'Malley, Arthur L. Loudspeaker apparatus. 4,286,688, Cl. 181-156.000.
Omron Tateisi Electronics Co.: *See*—
Kamiya, Fumio; Nodera, Hisatoshi; Ueda, Kenji; and Miyamoto, Hiroyuki, 4,287,440, Cl. 307-315.000.
Onodera, Kaoru, to Konishiroku Photo Industry Co., Ltd. Diffusion transfer color photographic film unit. 4,287,291, Cl. 430-218.000.
Oota, Masanori: *See*—
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op den Camp, Lutz E. A.: *See*—
Thomas, Alfred W.; and op den Camp, Lutz E. A., 4,286,501, Cl. 91-376.00R.
Ophir, Jonathan; Maklad, Nabil F.; and Jaeger, Paul M., to Acoustic Standards Corporation. Ultrasound phantom. 4,286,455, Cl. 73-1.0DV.
Opitz, Konrad: *See*—
Schneider, Manfred; Kruse, Hubert; Opitz, Konrad; and Billenstein, Siegfried, 4,286,960, Cl. 8-527.000.
Orban, Jean M., to Vivitar Corporation. Electronic slave flash delay device. 4,287,453, Cl. 315-159.000.
Orgill, Rodney H.: *See*—
Janes, Michael M.; and Orgill, Rodney H., 4,287,507, Cl. 340-146.30Z.
Original Hanau Heraeus GmbH: *See*—
Ilzig, Karl F.; and Scheidemann, Hans, 4,286,839, Cl. 350-96.240.
Orlando, Franklin P.; and Fitzmaurice, Richard W., to FMC Corporation. Vibratory fruit harvester. 4,286,426, Cl. 56-330.000.
Oronzio deNora Impianti Elettrochimici S.p.A.: *See*—
Pellegri, Alberto, 4,287,032, Cl. 204-128.000.
O'Rourke, Thomas J.: *See*—
Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, 4,287,081, Cl. 252-174.110.
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Osaki, Yasunari: *See*—
Gaku, Morio; Nagai, Norio; and Osaki, Yasunari, 4,287,014, Cl. 156-306.900.
Oscarson, John R.: *See*—
Celmer, Walter D.; Cullen, Walter P.; Huang, Liang H.; Oscarson, John R.; Shibakawa, Riichiro; and Tone, Junsuke, 4,287,182, Cl. 424-118.000.
Ostheim, James R.: *See*—
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Otada, Masami: *See*—
Nakamura, Yoshimitsu; and Otada, Masami, 4,286,375, Cl. 29-597.000.
Otis Engineering Corporation: *See*—
Gazda, Imre I., 4,286,661, Cl. 166-316.000.
Kohn, Gary A., 4,286,657, Cl. 166-117.500.
Otthofer, Jacob A., Jr., to Armstrong World Industries, Inc. Print screen stencil. 4,286,518, Cl. 101-128.210.
Outboard Marine Corporation: *See*—
Baltz, Gene F.; and DuBois, Chester G., 4,286,553, Cl. 123-187.50R.
Owen, James H., II, to Du Pont de Nemours, E. I., and Company. Emulsion-type explosive composition and method for the preparation thereof. 4,287,010, Cl. 149-2.000.
Owens-Corning Fiberglas Corporation: *See*—
Marzocchi, Alfred; Roberts, Michael G.; and Bolen, Charles E., 4,286,996, Cl. 106-282.000.
Marzocchi, Alfred; Roberts, Michael G.; and Bolen, Charles E., 4,286,997, Cl. 106-282.000.
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Oyama, Hajime: *See*—
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Pace, Wilson D.: *See*—
Cave, David L.; and Pace, Wilson D., 4,287,438, Cl. 307-297.000.
Pachmayr, Frank A.; and Farrar, Jack R., to Pachmayr Gun Works, Inc. Cushioned gun grip. 4,286,401, Cl. 42-71.00P.
Pachmayr Gun Works, Inc.: *See*—
Pachmayr, Frank A.; and Farrar, Jack R., 4,286,401, Cl. 42-71.00P.
Paerels, Gerard B.: *See*—
Van Gilse, Jaap; and Paerels, Gerard B., 4,286,983, Cl. 71-67.000.
Page, John S., Jr. Tubing drain. 4,286,662, Cl. 166-317.000.
Pakcel Converters Limited: *See*—
Ibbotson, Peter; Smith, John C.; and Frodsham, Colin, 4,287,274, Cl. 429-156.000.
Pako Corporation: *See*—
Laska, Ronald C., 4,286,868, Cl. 355-68.000.
Viland, Michael G., 4,286,392, Cl. 34-47.000.
Palacin, Francis: *See*—
Buser, Rolf; Palacin, Francis; Robert, Georg; and Somm, Franz, 4,286,961, Cl. 8-532.000.
Palmer-Shile Company: *See*—
Hall, Lee Z., 4,286,719, Cl. 211-193.000.
Pan, Robert B.; and Templeton, John S., III, to Exxon Production Research Company. Method for measuring the thickness of an ice sheet. 4,287,472, Cl. 324-65.00R.
Pangborn, Robert N.: *See*—
Kramer, Irvin R.; Weissman, Sigmund; and Pangborn, Robert N., 4,287,416, Cl. 250-273.000.
Panster, Peter; Buder, Wolfgang; and Kleinschmit, Peter, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Monomeric, polymeric and carrier-fixed rhodium complex compounds, process for their production and their use as catalysts. 4,287,094, Cl. 252-431.00R.
Papadopoulos, Andreas T. Soccer training goal. 4,286,786, Cl. 273-396.000.
Papantoniou, Christos: *See*—
Jacquet, Bernard; Papantoniou, Christos; and Mondet, Jean, 4,287,172, Cl. 424-47.000.
Pappas, Clifford J.; and Vickers, Albert F., to Frito-Lay, Inc. Hull containing compositions. 4,287,220, Cl. 426-623.000.
Parachem Corporation: *See*—
Hettinga, Siebolt, 4,286,731, Cl. 221-259.000.
Paradis, Joseph R.; and Kaleskas, Edward W., to Nypro, Inc. Control of fluid flow using longitudinally movable disc. 4,286,628, Cl. 137-843.000.
Parisien, Rudolph E. Fence system. 4,286,772, Cl. 256-65.000.
Parker, John J.: *See*—
Fouss, James L.; and Parker, John J., 4,286,808, Cl. 285-158.000.
Parker Manufacturing Company: *See*—
Porter, L. Steven; and Stockley, Raymond A., 4,286,904, Cl. 408-225.000.
Partridge, Charles C.: *See*—
Kacal, Gary W.; and Partridge, Charles C., 4,286,614, Cl. 137-72.000.
Pascarella, Vincent J.: *See*—
McDowell, John R.; Howard, Dennis D.; and Pascarella, Vincent J., 4,287,083, Cl. 252-182.000.
Pasternack, Adalbert, to Dragerwerk Aktiengesellschaft. Suit for protecting a person's body from heat and gas. 4,286,439, Cl. 62-259.300.
Patel, Raman: *See*—
Coran, Aubert Y.; and Patel, Raman, 4,287,324, Cl. 525-408.000.
Patrick, E. V.; Dickson, Howard K.; and Dunmire, Howard L., to United States of America, Army. Method and apparatus to fabricate image intensifier tubes. 4,286,833, Cl. 316-31.000.
Pattyn, Herman A.: *See*—
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Pauckert, Ronald P.: *See*—
Vrolyk, John J.; and Pauckert, Ronald P., 4,286,574, Cl. 126-400.000.
Paulish, Daniel J.; Meyerhoff, Albert J.; and Nickett, George R., to Burroughs Corporation. Method and apparatus for interfacing stations in a multiloop communications system. 4,287,592, Cl. 370-88.000.
Pawelka, Gustav J. Dual function handgrip control. 4,286,699, Cl. 192-1.000.
Paynter, Donald A.; and Burpee, Lee, to Arbiter Systems Incorporated. Satellite controlled clock. 4,287,597, Cl. 455-12.000.
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Gursky, Michael T.; and Pcihoda, William W., 4,286,860, Cl. 354-319.000.
Pechmeze, Jacques P. E.; and Sureau, Robert F. M., to Produits Chimiques Ugine Kuhlmann. Water-soluble polyfluoro acid azo dyestuffs. 4,287,121, Cl. 260-186.000.
Pejouhy, Radi, to Texas Instruments Incorporated. Current interrupting apparatus having improved contact life. 4,287,499, Cl. 337-97.000.
Pellegri, Alberto, to Oronzio deNora Impianti Elettrochimici S.p.A. Process for generating a halogen with novel electrodes. 4,287,032, Cl. 204-128.000.
Pellegrino, Bernard. Cup holder. 4,286,742, Cl. 224-281.000.
Peltzer, Bernd: *See*—
Schlak, Ottfried; Moretto, Hans-Heinrich; Clarenz, Werner; Peltzer, Bernd; and Burgmer, Willi, 4,287,109, Cl. 260-29.20M.
Penfield, Scott R., Jr., to Combustion Engineering, Inc. Compression hub for a fusion reactor system. 4,287,022, Cl. 176-3.000.
Pennella, Filippo, to Phillips Petroleum Company. Conversion of olefinic compounds. 4,287,378, Cl. 585-643.000.
Pennwalt Corporation: *See*—
Cushman, Robert H., 4,287,423, Cl. 250-439.00P.
Peripheral Dynamics, Inc.: *See*—
Auchinleck, Richard J., 4,287,409, Cl. 235-475.000.
Perkin-Elmer Corporation, The: *See*—
Quick, Donald L., 4,287,466, Cl. 323-275.000.
Perraud, Raymond J.: *See*—
Benichou, Alain; and Perraud, Raymond J., 4,286,899, Cl. 405-260.000.
Peters, Thomas E.; and Bateman, John M., to Morrison-Knudsen Forest Products Company, Inc. Method for orientation and deposition of lignocellulosic material in the manufacture of pressed comminuted products having directional properties. 4,287,140, Cl. 264-23.000.
Peters, Wolfgang: *See*—
Merten, Gerhard; Peters, Wolfgang; Schneider, Hans-Dieter; and Heyer, Willy, 4,286,823, Cl. 299-43.000.
Peterson, Robert R., to Barry Wright Corporation. Flexible coupling. 4,286,442, Cl. 64-31.000.
Peterson, Robert R.; and Ventura, Daniel S., to Barry Wright Corporation. Cylindrical elastomeric bearing. 4,286,827, Cl. 308-26.000.
Peterson, Robert S., to Westinghouse Electric Corp. Method and apparatus for automatic gauge control system for tandem rolling mills. 4,286,447, Cl. 72-9.000.
Peterson, Terry M., to Chevron Research Company. Cadmium sulfide photovoltaic cell of improved efficiency. 4,287,383, Cl. 136-260.000.
Petillon, Gisele M. C.: *See*—
Guglielmetti, Robert J.; Garnier, Francis; Poirier, Yves M.; and Petillon, Gisele M. C., 4,287,337, Cl. 544-6.000.
Petitpierre, Jean C., to Ciba-Geigy Corporation. Chromogenic propenylenesulfone compounds. 4,287,336, Cl. 542-472.000.
Petlak, Joseph J.; and Salafia, Joseph M., to Petlak, Joseph J. Air heater. 4,286,943, Cl. 431-352.000.
Petrova, Natalia P.: *See*—
Kapitanov, Nikolai N.; Petrova, Natalia P.; and Ippolitov, Vladimir V., 4,286,598, Cl. 128-303.00R.
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Johnson, Garland A.; and Peuler, Jacob D., 4,287,368, Cl. 568-436.000.
Pfaffle, Ernst, to Hans Sickinger Company. Device for facilitating separation of sheet groups. 4,286,908, Cl. 414-115.000.
Pfau, Jean: *See*—
Convers, Danielle; Balleys, Francois; and Pfau, Jean, 4,287,404, Cl. 219-69.00W.
Pfau, Paul; Fausel, Thomas E.; and Grunder, Arthur, to Simom S.A. Method of reproducing graphic material on an intaglio form. 4,287,537, Cl. 358-299.000.
Pfauter, Hermann: *See*—
Baumann, Erich; Mente, Hans-Peter; and Muller, Wolfgang, 4,286,479, Cl. 74-724.000.
Pfefferle, William C. Method of treating flue deposits and composition therefor. 4,287,090, Cl. 252-428.000.
Pfeifer, William. Merchandise hanger assembly. 4,286,764, Cl. 248-220.300.
Pfizer Inc.: *See*—
Celmer, Walter D.; Cullen, Walter P.; Huang, Liang H.; Oscarson, John R.; Shibakawa, Riichiro; and Tone, Junsuke, 4,287,182, Cl. 424-118.000.
Elliott, Donald O., Jr., 4,287,425, Cl. 250-445.00T.
Hess, Hans-Jurgen E.; Bindra, Jasjit S.; and Shah, Praful K., 4,287,341, Cl. 544-285.000.
Kellogg, Michael S., 4,287,181, Cl. 424-114.000.
Pharmakidis, Panayiotis D. Heat retention wall system. 4,286,420, Cl. 52-404.000.
Philip Morris Incorporated: *See*—
Swain, James W.; and Crayton, Frank H., 4,286,606, Cl. 131-276.000.
Phillips, Gary M., to Medtronic, Inc. Compositions of polyvinylpyridine and iodine. 4,287,319, Cl. 525-336.000.
Phillips, Kenneth G.; and Harris, Paul J., to Nalco Chemical Company. Improved method of preparing high molecular weight polyamines. 4,287,331, Cl. 528-397.000.

Phillips Petroleum Co.: *See—*
Cooper, William T., 4,287,023, Cl. 201-31.000.
Eastman, Alan D.; and Gardner, Lloyd E., 4,287,050, Cl. 208-215.000.
Janzen, Jay, 4,286,881, Cl. 356-440.000.
Pennella, Filippo, 4,287,378, Cl. 585-643.000.
Selman, Charles M., 4,287,091, Cl. 252-429.00B.
Tabler, Donald C.; and Johnson, Marvin M., 4,287,049, Cl. 208-180.000.
Uber, Raymond F.; Childers, Clifford W.; and Naylor, Floyd E., 4,287,313, Cl. 525-91.000.
Vinyard, Roy E., 4,286,366, Cl. 29-157.400.

Photocircuits Division of Kollmorgen Corp.: *See—*
Leech, Edward J., 4,287,253, Cl. 428-323.000.

Pickel, Hans: *See—*
Neitz, Alfred; Pickel, Hans; and D'Alfonso, Nunzio, 4,286,556, Cl. 123-279.000.

Pieslak, George; Erbes-Mrsny, Kathleen A.; and Fritchle, Elena C., to Raychem Corporation. Protecting metal substrates from corrosion. 4,287,034, Cl. 204-147.000.

Pietruck, Horst: *See—*
Hammer, Klaus-Dieter; Schroder, Martin; Pietruck, Horst; and Bytzek, Max, 4,287,217, Cl. 426-105.000.

Pietschmann, Helmut, to Sybron Corporation. Dental treatment apparatus. 4,286,948, Cl. 433-77.000.

Pigeon, Marcel; and de Maquille, Yannick, to Rhone-Poulenc-Graphic. Lithographic plate of tin-plated steel and method of manufacture. 4,287,288, Cl. 430-169.000.

Pignone, Joseph. Dual buoyancy device. 4,286,539, Cl. 114-331.000.

Pinkham, Clinton L., to General Electric Company. Amplitude limited varactor tuned L–C oscillator. 4,287,489, Cl. 331-117.00R.

Pinsler, Heinz W.: *See—*
Brown, George A.; Relyea, Lloyd A.; Scharfe, Merlin E.; and Pinsler, Heinz W., 4,287,279, Cl. 430-58.000.

Pircher, Georges, to Thomson-CSF. Optical fibre interferometric gyrometer with polarization switching. 4,286,878, Cl. 356-350.000.

Pirvics, Juris; and Vazirani, Hargovind N., to Bell Telephone Laboratories, Incorporated. Process for producing cover coated electronic circuits. 4,287,226, Cl. 427-54.100.

Pitman-Moore, Inc.: *See—*
Bittle, James L., 4,287,178, Cl. 424-89.000.

Pitney Bowes Inc.: *See—*
Cornwall, Frank H.; and Ross, William A., 4,286,863, Cl. 355-3.0FU.
Stelben, John J.; Siladi, Kim E.; Herman, George A., Jr.; and Vesel, John E., 4,286,866, Cl. 355-14.00D.

Pittasch, Willi, to Richard Heinze GmbH & Co. KG. Furniture hinge. 4,286,352, Cl. 16-130.000.

Pittway Corporation: *See—*
Nagel, Richard A., 4,287,517, Cl. 340-636.000.

Place, Virgil A.; and Crow, Harold L. Vaginal contraceptive shield. 4,286,593, Cl. 128-260.000.

Plaskon Products, Inc.: *See—*
Rosler, Robert K.; Gore, Donald B.; Riddell, Malcolm N.; and Hunt, Earl R., 4,287,105, Cl. 260-18.0EP.

Plastics Technology Associates, Inc.: *See—*
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Platt, John R.; and Benno, Edward L., to Illinois Tool Works Inc. Two-way container package. 4,286,711, Cl. 206-216.000.

Ploss, Helmut; and Remensperger, Alfons, to Warner Electric Brake & Clutch Company. Ice breaking and mud deflecting device for a ball screw and nut assembly. 4,286,793, Cl. 277-165.000.

Plotz, Kurt: *See—*
Gessner, Wolfgang; Kuhn, Helmut; and Plotz, Kurt, 4,287,248, Cl. 428-137.000.

Pochet, Andre G. G.: *See—*
Boute, Raymond T. G.; De Kinder, Wilfried L. J.; Neutjens, Gustaaf W. T.; Pochet, Andre G. G.; Vanderschoot, Jan P. M.; and Van Remortel, Jacques D. A., 4,287,590, Cl. 370-59.000.

Pocock, Robert E., to Babcock & Wilcox Company, The. Flexible filter. 4,286,472, Cl. 73-863.240.

Pohl, Winfried, to Robert Bosch GmbH. Method and system for creating a geometric figure at a selected position on the screen of a cathode ray tube. 4,287,534, Cl. 358-183.000.

Poirier, Yves M.: *See—*
Guglielmetti, Robert J.; Garnier, Francis; Poirier, Yves M.; and Petillon, Gisele M. C., 4,287,337, Cl. 544-6.000.

Polaroid Corporation: *See—*
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Norris, Philip R., 4,286,853, Cl. 354-123.000.

Polfus, William F.: *See—*
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Poli, Giovanni; and Poli, Vincenzo. Underwater paving machine and concrete blocks therefor. 4,286,895, Cl. 405-17.000.

Poli, Vincenzo: *See—*
Poli, Giovanni; and Poli, Vincenzo, 4,286,895, Cl. 405-17.000.

Pollock, David C. I., to C-I-L Inc. Method maintaining a constant gas to solids ratio in effluent from a long vertical shaft bioreactor. 4,287,070, Cl. 210-626.000.

Polyansky, Oleg J.: *See—*
Divin, Jury Y.; Polyansky, Oleg J.; and Shulman, Alexandr Y., 4,287,418, Cl. 250-336.000.

Pomares, Francis. Handle attaching means for rakes and the like. 4,286,893, Cl. 403-301.000.

Poncha, Rustom P.: *See—*
Booth, Elwood F., Jr.; and Poncha, Rustom P., 4,286,967, Cl. 23-298.000.

Pond, James W., Jr., to B. F. Goodrich Company, The. Replaceable tread tires. 4,286,644, Cl. 152-354.00R.

Ponsinet, Gerard: *See—*
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Popov, Alexandr D.; Solomin, Vladimir A.; Teptikov, Nikolai R.; and Demchenko, Jury D. Cylindrical linear induction motor. 4,287,444, Cl. 310-13.000.

Porter, James R.: *See—*
Jones, John E.; Fodor, William G.; Porter, James R.; and Edgell, James E., 4,286,610, Cl. 132-76.400.

Porter, L. Steven; and Stockley, Raymond A., to Parker Manufacturing Company. Wood bit. 4,286,904, Cl. 408-225.000.

Porzel, Francis B., to United States of America, Navy. Module to prevent sympathetic detonations in munitions. 4,286,708, Cl. 206-3.000.

Potomac Applied Mechanics: *See—*
Silcott, Philip B.; and Stubbings, James H., 4,286,739, Cl. 224-156.000.

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Spevak, Stephen T., 4,286,832, Cl. 312-283.000.

Potts, James E., to Union Carbide Corporation. Orthopedic devices, materials and methods. 4,286,586, Cl. 128-90.000.

Prall, Paul D., to Anchor Hocking Corporation. Cordierite crystal-containing glaze. 4,287,260, Cl. 428-410.000.

Pricer, Wilbur D., to International Business Machines Corporation. Sense amplifying system for memories with small cells. 4,287,576, Cl. 365-203.000.

Procter & Gamble Company, The: *See—*
Siklosi, Michael P., 4,287,080, Cl. 252-104.000.
Tolfo, Flavio; and Barrat, Christian R., 4,287,082, Cl. 252-174.120.

Proctor & Gamble Company, The: *See—*
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Breda, Frederic; Jonville, Pierre; Bonomi, Angelo; and Ambert, Jack, 4,287,270, Cl. 429-103.000.

Promis, George G.; Smith, Gerald L.; and Wilson, John C., to International Business Machines Corporation. Motor driving system. 4,287,461, Cl. 318-571.000.

Prosenbauer & Co. Maschinenhandel: *See—*
Prosenbauer, Otto, 4,286,510, Cl. 99-533.000.

Prosenbauer, Otto, to Prosenbauer & Co. Maschinenhandel. Device for injecting a treating liquid into material to be treated. 4,286,510, Cl. 99-533.000.

Prosl, Frank R.: *See—*
Sampson, Edward J.; and Prosl, Frank R., 4,286,584, Cl. 128-1.00R.

Prouty, Jonathan J. Kite-like flying device and accessories thereof. 4,286,762, Cl. 244-153.00R.

Prudhomme, Pierre; Lafaye, Jean-Jacques; and Rey, Raymond, to Seperef - TMP Societe pour l'Equipment des Reseaux en Canalisations de Matieres Plastiques. Process for impregnating spools of textile with a liquid composition. 4,287,237, Cl. 427-238.000.

Pump, Wichard: *See—*
Engelhard, Forest; Kuhn, Rainer; Pump, Wichard; Riess, Reinhard; and Streib, Hugo, 4,287,262, Cl. 428-461.000.

Puntil, Dennis M.: *See—*
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Purex Corporation: *See—*
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Queen, Daniel, to RHR Industries, Ltd. Microphone assembly for speech recording using noise-adaptive output level control. 4,287,391, Cl. 179-1.00P.

Quertain, Raoul: *See—*
Sears, I. Weir, Jr.; and Quertain, Raoul, 4,287,143, Cl. 264-46.800.

Quick, Donald L., to Perkin-Elmer Corporation, The. Control circuitry for maintaining forward and reflected transmission line power at a predetermined safe level. 4,287,466, Cl. 323-275.000.

R. D. Werner Co., Inc.: *See—*
Roche, John N., 4,286,353, Cl. 16-143.000.

R. J. Reynolds Tobacco Company: *See—*
Conrad, Lucas J., 4,286,910, Cl. 414-221.000.

Rabelos, Nicholas A., to Simpson, Charles J. Coin bank. 4,286,526, Cl. 109-73.000.

Raber, Samuel; Wynne, John M.; and Heim, Alan M., to Baker Industries, Inc. Fire detection system with multiple output signals. 4,287,515, Cl. 340-584.000.

Radiation Dynamics, Inc.: *See—*
Derbyshire, Rodney L., 4,287,011, Cl. 156-85.000.

Raines, Kenneth, to Burron Medical Inc. Syringe cap. 4,286,591, Cl. 128-215.000.

Raines, Kenneth, to Burron Medical Inc. Filter hub assembly. 4,287,065, Cl. 210-445.000.

Ralph, Harold D.: *See—*
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Ramesbothom, Arde: *See—*
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Ramey, Richard R.: *See—*
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Rapp, Peter: *See—*
Wagner, Fritz; Rapp, Peter; Bock, Hans; Lindorfer, Walter; Schulz, Walther; and Gebetsberger, Wilhelm, 4,286,660, Cl. 166-246.000.
Ratcliffe, Charles T., to Allied Corporation. Process for preparing epoxides. 4,287,128, Cl. 260-348.230.
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Hahn, Klaus; Rath, Hans P.; and Walter, Manfred, 4,287,258, Cl. 428-407.000.
Ray, William E.: *See—*
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Raybestos-Manhattan, Inc.: *See—*
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Raychem Corporation: *See—*
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Pieslak, George; Erbes-Mrsny, Kathleen A.; and Fritchle, Elena C., 4,287,034, Cl. 204-147.000.
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Raytheon Company: *See—*
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Rudko, Robert I.; and Barnie, James W., 4,287,483, Cl. 331-94.5PE.
RCA Corporation: *See—*
Demers, Robert R., 4,287,256, Cl. 428-375.000.
Simshauser, Elvin D.; and Nosker, Richard W., 4,287,587, Cl. 369-50.000.
Siryj, Bohdan W.; and Gilson, Alan P., 4,286,790, Cl. 369-36.000.
Young, William C., 4,287,496, Cl. 333-248.000.
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Read, Marjorie S.: *See—*
Brinkhous, Kenneth M.; and Read, Marjorie S., 4,287,087, Cl. 252-408.000.
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Reder, Rodney: *See—*
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Reeves Brothers, Inc.: *See—*
West, George C.; and Polfus, William F., 4,287,261, Cl. 428-421.000.
Rehrig, B. Houston. Telescoping shopping cart. 4,286,795, Cl. 280-33.99H.
Reichard, Michel; and Krassoulia, Georges, to Societe Europeene de Propulsion. Ignition system for combustible gases or liquids. 4,286,431, Cl. 60-39.82E.
Reil, Wilhelm; and Trabitzsch, Jorg, to Tetra Pak International AB. Packing laminate provided with crease lines. 4,287,247, Cl. 428-129.000.
Reischl, Artur; Mack, Kurt; and Sahlmen, Friedhelm, to Bayer Aktiengesellschaft. Process for the improved working up of effluent. 4,287,069, Cl. 210-609.000.
Reisdorf, Daniel: *See—*
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Reiss, Wolfgang: *See—*
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Reistad, Bengt R.: *See—*
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Remensperger, Alfons: *See—*
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Research Foundation of State University of New York, The: *See—*
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Research Products Corp.: *See—*
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Research Triangle Institute: *See—*
Brinkhous, Kenneth M.; and Read, Marjorie S., 4,287,087, Cl. 252-408.000.
Retrum, Rowland. Apparatus for hydrolyzing keratinaceous material. 4,286,884, Cl. 366-149.000.
Reuvekamp, Antonius H. J., to U.S. Philips Corporation. Transmission bridge for a subscriber's circuit. 4,287,393, Cl. 179-70.000.
Rey, Raymond: *See—*
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Reytblatt, Zinovy V. Polariscope and filter therefor. 4,286,843, Cl. 350-396.000.
Rhoades, Thomas S.: *See—*
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RHR Industries, Ltd.: *See—*
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Rich, Martin D.: *See—*
Rich, Norman I.; and Rich, Martin D., 4,287,218, Cl. 426-272.000.
Rich, Norman I.; and Rich, Martin D. Ready-to-eat molded meat product. 4,287,218, Cl. 426-272.000.
Rich, Richard D., to Loctite Corporation. Accelerator for curable compositions. 4,287,330, Cl. 526-270.000.
Richard Heinze GmbH & Co. KG: *See—*
Pittasch, Willi, 4,286,352, Cl. 16-130.000.
Richard Hirschmann Radiotechnisches Werk: *See—*
Siegwarth, Martin, 4,287,510, Cl. 340-384.00E.
Richards, Gerald P., to Raytheon Company. Voltage generator with self-contained performance monitor. 4,287,506, Cl. 340-146.30R.
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Richert, Manfred, to Vereinigte Baubeschlagfabriken Gretsch & Co. GmbH. Safety toe unit for a ski binding. 4,286,801, Cl. 280-629.000.
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Kosa, Edit; Borvendeg, Janos; Huszti, Zsuzsanna; Kosary, Judit; Szilagyi, Geza; Tardos, Laszlo; Kasztreiner, Endre; Nagy, Laszlo; Szuucs, Erzsebet; and Kiss, Gabriella, 4,287,194, Cl. 424-248.510.
Ricoh Company, Ltd.: *See—*
Ohnuma, Teruyuki; Miyakawa, Seiichi; and Oyama, Hajime, 4,286,543, Cl. 118-657.000.
Satomi, Toyokazu; Ohminato, Mitsuru; and Tabata, Yasuhiro, 4,286,865, Cl. 355-14.0CU.
Riddell, Malcolm N.: *See—*
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Riess, Reinhard: *See—*
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Rieux, Jean-Philippe, to Rhone-Poulenc Industries. Compositions useful for consolidation of mining deposits. 4,287,111, Cl. 260-29.6RW.
Riley, Robert E.; Newkirk, Lawrence R.; Valencia, Flavio A.; and Wallace, Sr., Terry C., to United States of America, Energy. Preparation and uses of amorphous boron carbide coated substrates. 4,287,259, Cl. 428-408.000.
Ring, David F., to Johnson & Johnson Products, Inc. Compact tampon applicator assembly. 4,286,595, Cl. 128-263.000.
Riseberg, Leslie A.: *See—*
Feuersanger, Alfred E.; Riseberg, Leslie A.; and McNeill, William H., 4,287,454, Cl. 315-178.000.
Rite-Hite Corporation: *See—*
Hahn, Norbert, 4,286,410, Cl. 49-33.000.
Ritter, Ernst; Schwartz, Reinhard; Muller, Rolf; and Bohm, Martin, to Robert Bosch GmbH. Pneumatic diaphragm control member for a fuel injection device for internal combustion engines. 4,286,559, Cl. 123-383.000.
Ritter, Ernst: *See—*
Djordjevic, Ilija; Ritter, Ernst; and Lang, Thomas, 4,286,558, Cl. 123-368.000.
Riva, Ermete: *See—*
Sisti, Giorgio; Riva, Ermete; and Sala, Learco, 4,286,456, Cl. 73-23.100.
Robert Bosch GmbH: *See—*
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Hafele, Walter; and Schenk, Bernhard, 4,286,931, Cl. 417-490.000.
Haubner, Georg; Wesemeyer, Jurgen; Schrumpf, Hans; Birmelin, Jorg; Schwab, Manfred; Honig, Gunter; Kiencke, Uwe; Schulz, Alfred; and Meier, Werner, 4,287,565, Cl. 364-580.000.
Leiber, Heinz, 4,286,626, Cl. 137-625.650.
Leiber, Heinz, 4,286,826, Cl. 303-114.000.
Pohl, Winfried, 4,287,534, Cl. 358-183.000.
Ritter, Ernst; Schwartz, Reinhard; Muller, Rolf; and Bohm, Martin, 4,286,559, Cl. 123-383.000.
Stumpp, Gerhard; and Wessel, Wolf, 4,286,615, Cl. 137-117.000.
Robert, Georg: *See—*
Buser, Rolf; Palacin, Francis; Robert, Georg; and Somm, Franz, 4,286,961, Cl. 8-532.000.
Roberts, Michael G.: *See—*
Marzocchi, Alfred; Roberts, Michael G.; and Bolen, Charles E., 4,286,996, Cl. 106-282.000.
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Robertshaw Controls Company: *See—*
Strachan, Robert; and Goodhouse, Carl J., 4,287,583, Cl. 368-10.000.

Robertson, Merrill L. Adjustable balance, extension boat trailer. 4,286,906, Cl. 414-477.000.
Robinson, Ronald A., to Purex Corporation. Liquid cleanser formula. 4,287,079, Cl. 252-99.000.
Robinson, Ruth A. Method for preserving plant material. 4,287,222, Cl. 427-4.000.
Robinson, Storm D.; and Rode, Douglas M., to Combustion Engineering, Inc. System for ash removal. 4,286,527, Cl. 110-165.00A.
Rocco, William A.: *See—*
Wentorf, Robert H., Jr.; and Rocco, William A., 4,287,168, Cl. 423-446.000.
Roche, Alain-Gilbert, to Societe Anonyme Automobiles Citroen. Oleopneumatic suspension with telescopic leg for vehicles. 4,286,802, Cl. 280-693.000.
Roche, John N., to R. D. Werner Co., Inc. Multi-element connection for structural members. 4,286,353, Cl. 16-143.000.
Roche, Mary E. Educational toy. 4,286,952, Cl. 434-259.000.
Rockwell International Corporation: *See—*
Alexander, Robert H., 4,286,458, Cl. 73-862.210.
Ayres, Robert L., 4,286,799, Cl. 280-96.100.
Lee, Winston F. Z.; White, Raymond V.; and Sciulli, Felice M., 4,286,471, Cl. 73-861.840.
Vrolyk, John J.; and Pauckert, Ronald P., 4,286,574, Cl. 126-400.000.
Rockwool International A/S: *See—*
Holbek, Kjeld, 4,287,142, Cl. 264-37.000.
Rode, Douglas M.: *See—*
Robinson, Storm D.; and Rode, Douglas M., 4,286,527, Cl. 110-165.00A.
Rodionov, Evgeny I.: *See—*
Bashnin, Oleg I.; Semenov, Vasily V.; Fedorov, Vasily N.; Rodionov, Evgeny I.; Davidson, Boris A.; and Schegolev, Gleb S., 4,287,429, Cl. 290-40.00C.
Roeder, Allan W.: *See—*
Eaton, William G.; and Roeder, Allan W., 4,287,475, Cl. 328-167.000.
Roerig, Arnold J.: *See—*
Justus, Edgar J.; and Roerig, Arnold J., 4,287,021, Cl. 162-358.000.
Rogers, Stanley L. One way fishing sinker. 4,286,403, Cl. 43-43.120.
Rogers, William H., to Alpha Plastics, Inc. Handgun holster. 4,286,741, Cl. 224-193.000.
Rohm and Haas Company: *See—*
Hurt, William S., 4,287,189, Cl. 424-210.000.
Rohrbach, William R., to Western Electric Company, Inc. Mode-indicating mechanisms for push-button operated devices. 4,287,401, Cl. 200-308.000.
Rokop Corporation: *See—*
Rokop, Joseph; and Rokop, Nikolaus, 4,286,649, Cl. 164-446.000.
Rokop, Joseph; and Rokop, Nikolaus, to Rokop Corporation. Apparatus for storing a continuous casting starting bar in elevated position. 4,286,649, Cl. 164-446.000.
Rokop, Nikolaus: *See—*
Rokop, Joseph; and Rokop, Nikolaus, 4,286,649, Cl. 164-446.000.
Roller Bearing Company of America: *See—*
Rongley, Raymond A., 4,286,894, Cl. 403-372.000.
Rolls-Royce Limited: *See—*
Gale, Anthony G., 4,286,924, Cl. 416-97.00R.
Rongley, Raymond A., to Roller Bearing Company of America. Tolerance rings. 4,286,894, Cl. 403-372.000.
Ronning, Albert J., to Minnesota Mining & Manufacturing Company. Comformable, multilayered tape adherent on one surface to fusable metal alloys and on the other surface to ophthalmic lens blanks. 4,287,013, Cl. 156-242.000.
Roof, John K. Musical instrument training device. 4,286,495, Cl. 84-485.00R.
Roots, Philip S., to Van Tongeren U.K. Limited. Support system for internal structure in a high temperature vessel. 4,287,158, Cl. 422-241.000.
Roper Corporation: *See—*
Stewart, Charles; and Condon, Richard W., 4,286,682, Cl. 180-9.24A.
Roskott, Lodewijk: *See—*
Beyleveld, Wilhelmus M.; and Roskott, Lodewijk, 4,287,371, Cl. 568-563.000.
Rosler, Robert K.; Gore, Donald B.; Riddell, Malcolm N.; and Hunt, Earl R., to Plaskon Products, Inc. Flash resistant epoxy encapsulating composition and process for preparing same. 4,287,105, Cl. 260-18.0EP.
Ross, Cecil J.; and Thompson, John F., to W. R. Weaver Company. Sight with reduced friction line of sight adjustment. 4,286,388, Cl. 33-246.000.
Ross, William A.: *See—*
Cornwall, Frank H.; and Ross, William A., 4,286,863, Cl. 355-3.0FU.
Roussel Uclaf: *See—*
Heymes, Rene; and Lutz, Andre, 4,287,193, Cl. 424-246.000.
Row, Scott: *See—*
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Rowe Corporation: *See—*
Lemond, Phillip E.; La Shomb, S. Donald; and Rowe, Oliver R., Sr., 4,286,398, Cl. 37-2.00R.
Rowe, Joseph R.; and Sanders, Eugene T., to Southwire Company. Dumpable crop bar container. 4,286,913, Cl. 414-422.000.
Rowe, Oliver R., Sr.: *See—*
Lemond, Phillip E.; La Shomb, S. Donald; and Rowe, Oliver R., Sr., 4,286,398, Cl. 37-2.00R.
Rowley, Gerald L.: *See—*
Gibbons, Ian; Rowley, Gerald L.; and Ullman, Edwin F., 4,287,300, Cl. 435-5.000.
Rubel, Laurence P. Apparatus for monitoring the delivery of material. 4,286,487, Cl. 83-58.000.
Rubinstein, Herbert: *See—*
Rubinstein, Morton K., 4,286,596, Cl. 128-270.000.
Rubinstein, Morton K., to Rubinstein, Herbert. Tampon containing a liquid medicant. 4,286,596, Cl. 128-270.000.
Rubner, Roland; Kuhn, Eberhard; and Ahne, Hellmut, to Siemens Aktiengesellschaft. Method for the preparation of relief structures by phototechniques. 4,287,294, Cl. 430-306.000.
Rudko, Robert I.; and Barnie, James W., to Raytheon Company. Transverse excitation laser. 4,287,483, Cl. 331-94.5PE.
Rudolf, Peter; Steck, Werner; Koester, Eberhard; Ohlinger, Manfred; and Jaeckh, Christof, to BASF Aktiengesellschaft. Manufacture of acicular cobalt-containing magnetic iron oxide. 4,287,233, Cl. 427-127.000.
Rudolph, Pamela; Krieder, Robert D.; and O'Keefe, Patrick J., Jr., to Bendix Corporation, The. Speed control for heavy duty trucks. 4,286,685, Cl. 180-176.000.
Rudy, Marion F., to Bogert, Robert C., a part interest. Elastomeric cushioning devices for products and objects. 4,287,250, Cl. 428-166.000.
Rugen, Donald F.: *See—*
Earhart, Harold W.; and Rugen, Donald F., 4,287,074, Cl. 585-6.300.
Ruhe, Anthony; and Nickerson, James H. D., to Foster Wheeler Limited. Heat exchanger tube supports. 4,286,654, Cl. 165-172.000.
Rumps, Norbert A., to Teletype Corporation. Connector block with strain prevention. 4,286,836, Cl. 339-97.00R.
Rupp, Arthur F.; and Woo, David V., to United States of America, Energy. Preparation of high purity phosphorus. 4,287,165, Cl. 423-323.000.
Russell, Robert C. H., to National Research Development Corporation. Embankments construction. 4,287,141, Cl. 264-33.000.
Ryan, Charles T.: *See—*
Bachmann, Klaus J.; and Ryan, Charles T., 4,287,527, Cl. 357-30.000.
Ryan, Kenneth M.: *See—*
Liu, Thomas M[illegible] Melillo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and [illegible]r, Meyer, 4,287,123, Cl. 260-239.00A.
Rybalkin, Evgeny P.: *See—*
Fastritsky, Viktor S.; Fishkin, Pavel S.; and Rybalkin, Evgeny P., 4,287,474, Cl. 324-233.000.
Rybnikov, Sergei I.: *See—*
Godin, Eduard M.; Anoshko, Vladimir A.; Gavrilov, Anatoly N.; Akhmerov, Almas F.; Zverkov, Garik E.; Semenov, Valentin P.; Grachev, Vladimir V.; Chepurin, Valentin M.; Mikhailov, Viktor Y.; and Rybnikov, Sergei I., 4,286,450, Cl. 72-59.000.
Ryckman, George, to Service (Engineers) Limited. Oval dish former. 4,286,938, Cl. 425-265.000.
S.A.E.I. Celite: *See—*
Benichou, Alain; and Perraud, Raymond J., 4,286,899, Cl. 405-260.000.
S.S.O.S. Sub Sea Oil Services S.p.A.: *See—*
Santi, Giunio G., 4,286,565, Cl. 123-568.000.
Saarbergwerke A.G.: *See—*
Muller, Rudolf; Klinkner, Hans-Guido; and Culmann, Gunter, 4,286,994, Cl. 106-109.000.
Sac Membrane Products Corporation: *See—*
Davis, William J., 4,287,275, Cl. 429-206.000.
Sachdev, Harbans S.: *See—*
Kadehjian, Leo J.; Sachdev, Harbans S.; and Snyder, Clinton D., 4,286,989, Cl. 106-22.000.
Sackmann, Gunter: *See—*
Himmelmann, Wolfgang; Bruck, Rolf; Sauerteig, Wolfgang; Kruck, Peter; Kolb, Gunter; and Sackmann, Gunter, 4,287,299, Cl. 430-537.000.
Sacks, Paul S.: *See—*
Cann, Peter L.; and Sacks, Paul S., 4,286,435, Cl. 62-81.000.
Safaev, Abidzhan; Kadyrov, Abduvasit; Saidaliev, Zhakhongir G.; and Faiziev, Tulyagan F. N,N-bis-(decahydroquinolyl-N-methyl-)imidazolin-2-thiones. 4,287,344, Cl. 546-164.000.
Saffley, Edgar F., to ACF Industries, Inc. Machine control apparatus. 4,286,446, Cl. 72-5.000.
Saft-Societe des Accumulateurs Fixes et de Traction: *See—*
Godard, Pierre; and Billot, Michel, 4,287,465, Cl. 320-56.000.
Sagisaka, Yasuo; Kondo, Toshio; and Kobayashi, Akio, to Nippondenso Co., Ltd. Method and apparatus for controlling an ignition timing. 4,286,560, Cl. 123-417.000.
Sahlmen, Friedhelm: *See—*
Reischl, Artur; Mack, Kurt; and Sahlmen, Friedhelm, 4,287,069, Cl. 210-609.000.
Saidaliev, Zhakhongir G.: *See—*
Safaev, Abidzhan; Kadyrov, Abduvasit; Saidaliev, Zhakhongir G.; and Faiziev, Tulyagan F., 4,287,344, Cl. 546-164.000.
St. Hilaire, A. Robert: *See—*
Taylor, Neil J.; St. Hilaire, A. Robert; and Johnson, James L., 4,286,409, Cl. 47-40.500.
Saito, Yasunori, to Sumitomo Electric Industries, Ltd. Phase stabilization type coaxial cable. 4,287,384, Cl. 174-29.000.
Saito, Yoshiharu: *See—*
Inoue, Haruo; Yokota, Shigeru; and Saito, Yoshiharu, 4,286,81[illegible] 296-65.00R.

Saitou, Tadashi: *See*—
Sakamaki, Hiroshi; Maeda, Toshiyuki; Ushijima, Fumihiro; and Saitou, Tadashi, 4,286,933, Cl. 418-15.000.

Saizi, Mituhiro: *See*—
Tanimoto, Akira; and Saizi, Mituhiro, 4,287,584, Cl. 368-63.000.

Sakamaki, Hiroshi; Maeda, Toshiyuki; Ushijima, Fumihiro; and Saitou, Tadashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Rotary vane pump with pairs of end inlet or outlet ports. 4,286,933, Cl. 418-15.000.

Sakamoto, Hitoshi; and Wakisaka, Yoshiaki, to Sony Corporation. Magnetic head tracking control system. 4,287,538, Cl. 360-10.000.

Sakanishi, Akihiro: *See*—
Ueda, Kenji; and Sakanishi, Akihiro, 4,287,046, Cl. 204-266.000.

Sakuma, Hiraku, to Nippon Electric Co., Ltd. Insulated gate field effect transistor. 4,287,526, Cl. 357-23.000.

Sakuramoto, Akira: *See*—
Kitagawa, Yoshihiko; Hanamura, Yoshimi; Yuyama, Masahiro; Moritani, Masahiko; Sakuramoto, Akira; and Suzuki, Mikio, 4,287,317, Cl. 525-309.000.

Sala, Learco: *See*—
Sisti, Giorgio; Riva, Ermete; and Sala, Learco, 4,286,456, Cl. 73-23.100.

Salafia, Joseph M.: *See*—
Petlak, Joseph J.; and Salafia, Joseph M., 4,286,943, Cl. 431-352.000.

Saline Processors, Inc.: *See*—
Garrett, Donald E.; and Laborde, Martin, 4,287,163, Cl. 423-283.000.

Salonia, Joseph R.: *See*—
Goller, Glen J.; and Salonia, Joseph R., 4,287,232, Cl. 427-113.000.

Salter, Lowell S., Jr., to Morgan Construction Company. Combination roll neck and bearing assembly. 4,286,830, Cl. 308-207.00R.

Samanta, Shyam K., to Ford Motor Company. Method of machining steel, malleable or nodular cast iron. 4,286,905, Cl. 409-132.000.

Samejima, Kazuhiro: *See*—
Ohnishi, Masaru; and Samejima, Kazuhiro, 4,287,524, Cl. 346-154.000.

Sampson, Edward J.; and Prosl, Frank R., to Infusaid Corporation. Septum locating apparatus. 4,286,584, Cl. 128-1.00R.

Samu, Mihaly: *See*—
Fabian, Zsolt; Samu, Mihaly; and Balogh, Barnabas, 4,287,470, Cl. 324-61.00R.

Sanders, Eugene T.: *See*—
Rowe, Joseph R.; and Sanders, Eugene T., 4,286,913, Cl. 414-422.000.

Sanders, James M.: *See*—
Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, 4,287,081, Cl. 252-174.110.

Sandoz, Inc.: *See*—
Babington, Ronald G.; Harrington, F. Eugene; and Houlihan, William J., 4,287,196, Cl. 424-251.000.
Kathawala, Faizulla G., 4,287,355, Cl. 560-18.000.

Sandoz Ltd.: *See*—
Buser, Rolf; Palacin, Francis; Robert, Georg; and Somm, Franz, 4,286,961, Cl. 8-532.000.

Sandrock, Gerhard: *See*—
Brunner, Erwin; Schubert, Eckart; Lindner, Alfred; Merger, Franz; Volkamer, Klaus; Strohmeyer, Max; and Sandrock, Gerhard, 4,287,379, Cl. 585-839.000.

Sands, John L.: *See*—
Garman, John A.; Mamuzic, Rastko I.; McDonald, Robert B.; Sands, John L.; and Thompson, Gregory, 4,287,373, Cl. 568-639.000.

Sandvik, Ind.: *See*—
Jones, John E.; Fodor, William G.; Porter, James R.; and Edgell, James E., 4,286,610, Cl. 132-76.400.

Sanner, Sidney N. Catamaran sailboat. 4,286,533, Cl. 114-39.000.

Sanner, Sidney N. Trimaran sailboat. 4,286,534, Cl. 114-39.000.

Santi, Giunio G., to S.S.O.S. Sub Sea Oil Services S.p.A. Engine control installation. 4,286,565, Cl. 123-568.000.

Sanzenbacher, Charles W.: *See*—
Scarlett, John C.; and Sanzenbacher, Charles W., 4,286,775, Cl. 266-147.000.

Sasaki, Isao: *See*—
Kamada, Kazumasa; Sasaki, Isao; and Kushi, Kenji, 4,287,227, Cl. 427-54.100.

Sasaki, Kouji: *See*—
Kuwabara, Kouji; Sugawara, Hiroyuki; Shirakura, Toshiharu; Sasaki, Kouji; and Takemori, Satoshi, 4,287,487, Cl. 331-94.50G.

Sasaki, Takao: *See*—
Nozawa, Ryoichiro; Amemiya, Yoichi; Kawamata, Mitsuo; Isohata, Shigeru; Sasaki, Takao; and Takekoshi, Yoshitaka, 4,287,460, Cl. 318-571.000.

Sassus-Bourda, Gerard: *See*—
Bres, Philippe; Berge, Christian; and Sassus-Bourda, Gerard, 4,286,461, Cl. 73-155.000.

Sato, Akihiro: *See*—
Kikuta, Kazutsune; Tachibana, Masami; and Sato, Akihiro, 4,287,328, Cl. 526-115.000.

Sato, Atsushi: *See*—
Shimizu, Isoo; Tsuji, Okitsugu; Matsuzaka, Eiichi; and Sato, Atsushi, 4,287,376, Cl. 585-458.000.

Sato, Kunihiko; Urata, Tetsuro; Kawano, Mitsugi; Jinba, Terumasa; Kato, Yukio; and Uebayashi, Takeo, to Mitsubishi Denki Kabushiki Kaisha; and Nippon Kokan Kabushiki Kaisha. Method and apparatus for adjusting the gap in an electric discharge machine. 4,287,403, Cl. 219-69.00M.

Sato, Makoto: *See*—
Ohmori, Taiji; Sato, Makoto; and Tsuchiya, Yoshikazu, 4,287,505, Cl. 340-52.00B.

Sato, Masahiko: *See*—
Ohmae, Takashi; Fukaya, Yasuhiro; Yoshida, Yasuyuki; Oka, Tamotu; Sato, Masahiko; and Nagareda, Masazumi, 4,287,405, Cl. 219-136.000.

Sato, Syuzi: *See*—
Murakami, Ryoichi; Shimizu, Hideo; and Sato, Syuzi, 4,287,004, Cl. 148-6.15R.

Sato, Takao: *See*—
Arita, Setsuo; and Sato, Takao, 4,287,508, Cl. 340-150.000.

Sato, Takayuki, to Tokyo Ohka Kogyo Kabushiki Kaisha. Photoresist cyclized rubber and bisazide compositions containing a monoazo photoextinction agent. 4,287,289, Cl. 430-196.000.

Satomi, Toyokazu; Ohminato, Mitsuru; and Tabata, Yasuhiro, to Ricoh Company, Ltd. Electrophotographic copying apparatus for the production of multiple copies from a single latent electrostatic image. 4,286,865, Cl. 355-14.0CU.

Sauerteig, Wolfgang: *See*—
Himmelmann, Wolfgang; Bruck, Rolf; Sauerteig, Wolfgang; Kruck, Peter; Kolb, Gunter; and Sackmann, Gunter, 4,287,299, Cl. 430-537.000.

Savage, David W.; Chang, Chin H.; and Longo, John M., to Exxon Research & Engineering Co. Vapor phase adsorption using nonstoichiometric carbon-sulfur compounds. 4,286,972, Cl. 55-58.000.

Savin Corporation: *See*—
Landa, Benzion, 4,286,886, Cl. 400-118.000.

Sawyer, David E., to United States of America, Energy. Nondestructive method for detecting defects in photodetector and solar cell devices. 4,287,473, Cl. 324-158.00R.

Scahill, Steven; and Burrafato, Gary M. End seal for conduits. 4,287,386, Cl. 174-76.000.

Scarlett, John C.; and Sanzenbacher, Charles W., to Midrex Corporation. Apparatus for producing molten iron from iron oxide with coal and oxygen. 4,286,775, Cl. 266-147.000.

Schaeffer, Howard J., to Burroughs Wellcome Co. Purine derivatives. 4,287,188, Cl. 424-200.000.

Schantz, Spencer C. Bimetal actuated locking device. 4,286,811, Cl. 292-201.000.

Scharfe, Merlin E.: *See*—
Brown, George A.; Relyea, Lloyd A.; Scharfe, Merlin E.; and Pinsler, Heinz W., 4,287,279, Cl. 430-58.000.

Schegolev, Gleb S.: *See*—
Bashnin, Oleg I.; Semenov, Vasily V.; Fedorov, Vasily N.; Rodionov, Evgeny I.; Davidson, Boris A.; and Schegolev, Gleb S., 4,287,429, Cl. 290-40.00C.

Scheibel, Edward G., to Suntech, Inc. Separation of ammonia from ammonia containing gases. 4,287,162, Cl. 423-238.000.

Scheidemann, Hans: *See*—
Ilzig, Karl F.; and Scheidemann, Hans, 4,286,839, Cl. 350-96.240.

Scheneman, Herbert T., Jr.; and Maggio, Karl F. Automatic slip coupling assembly. 4,286,441, Cl. 64-30.00C.

Schenk, Bernhard: *See*—
Hafele, Walter; and Schenk, Bernhard, 4,286,931, Cl. 417-490.000.

Scherenberg, Hans O.; Breitschwerdt, Werner; Klein, Wilhelm; and Jahn, Walter, to Daimler-Benz Aktiengesellschaft. Push button, especially for locks of safety belts. 4,286,359, Cl. 24-230.00R.

Schettler, Helmut: *See*—
Brosch, Rudolf; Schettler, Helmut; Schumacher, Hans; and Zuehlke, Rainer, 4,287,437, Cl. 307-296.00R.

Scheurecker, Werner; and Drab, Ernst, to Voest-Alpine Aktiengesellschaft. Carrying tower for a metallurgical vessel. 4,286,678, Cl. 177-132.000.

Schiesser AG: *See*—
Schiesser, Walter H., 4,286,882, Cl. 366-76.000.

Schiesser, Walter H., to Schiesser AG. Apparatus for the automatic, uniform drawing-in of elastomeric material into worm extruders. 4,286,882, Cl. 366-76.000.

Schillreff, George H.: *See*—
Block, Kenneth A.; Carter, William M.; and Schillreff, George H., 4,286,498, Cl. 86-1.00R.

Schindling, Josef: *See*—
Schminke, Heinz; and Schindling, Josef, 4,286,974, Cl. 55-126.000.

Schinschke, James R.: *See*—
Wikkerink, Lee; and Schinschke, James R., 4,286,411, Cl. 49-252.000.

Schlak, Ottfried; Moretto, Hans-Heinrich; Clarenz, Werner; Peltzer, Bernd; and Burgmer, Willi, to Bayer Aktiengesellschaft. Aqueous silicone-polyester resin systems, a process for their production and their use. 4,287,109, Cl. 260-29.20M.

Schlesinger, Sheldon I., to American Can Company. Photopolymerizable epoxide coating compositions containing titanium dioxide pigment and method of polymerization using same. 4,287,228, Cl. 427-54.100.

Schloemann-Siemag Aktiengesellschaft: *See*—
Exner, Klaus, 4,286,453, Cl. 72-273.000.

Schmelzer Corporation: *See*—
Detweiler, Charles A., 4,286,433, Cl. 60-602.000.

Schmidt, Gustav A.: *See*—
Wong, K. Lim; and Schmidt, Gustav A., 4,287,255, Cl. 428-343.000.

Schmidt, Walter: *See*—
Becker, Hans-Joachim; and Schmidt, Walter, 4,287,365, Cl. 564-422.000.

Schminke, Heinz; and Schindling, Josef, to Metallgesellschaft Aktiengesellschaft. Compound particle separator. 4,286,974, Cl. 55-126.000.
Schmitt, Frederick L.: *See—*
Boden, Richard M.; Dekker, Lambert; Schmitt, Frederick L.; and Van Loveren, Augustinus G., 4,287,084, Cl. 252-187.00H.
Sprecker, Mark A.; Trenkle, Robert W.; Mookherjee, Braja D.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; and Schmitt, Frederick L., 4,287,133, Cl. 260-458.00R.
Schneider, Eckart; and Delingat, Eckart, to Ernst Leitz Wetzlar GmbH. Optical correlator. 4,286,872, Cl. 356-28.000.
Schneider, H. Allen, to Weigh Right Electronic Systems, Inc. Animal scale. 4,286,679, Cl. 177-132.000.
Schneider, Hans-Dieter: *See—*
Merten, Gerhard; Peters, Wolfgang; Schneider, Hans-Dieter; and Heyer, Willy, 4,286,823, Cl. 299-43.000.
Schneider, Horst, to Th. Kieserling & Albrecht Werkzeugmaschinenfabrik. Machine for straightening elongated workpieces. 4,286,452, Cl. 72-164.000.
Schneider, Manfred; Kruse, Hubert; Opitz, Konrad; and Billenstein, Siegfried, to Hoechst Aktiengesellschaft. Dyestuff compositions containing acylated alkoxylates of polyhydric aliphatic alcohols. 4,286,960, Cl. 8-527.000.
Scholz, Werner, to Licentia Patent-Verwaltungs-GmbH. Circuit for selectively obtaining automatic dynamic compression or expansion. 4,287,491, Cl. 333-14.000.
Schreiber, William L.: *See—*
Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, 4,287,081, Cl. 252-174.110.
Schroder, Martin: *See—*
Hammer, Klaus-Dieter; Schroder, Martin; Pietruck, Horst; and Bytzek, Max, 4,287,217, Cl. 426-105.000.
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Baer, Karl; Reiss, Wolfgang; Schroeder, Wolfgang; and Voges, Dieter, 4,287,099, Cl. 252-465.000.
Schrumpf, Hans: *See—*
Haubner, Georg; Wesemeyer, Jurgen; Schrumpf, Hans; Birmelin, Jorg; Schwab, Manfred; Honig, Gunter; Kiencke, Uwe; Schulz, Alfred; and Meier, Werner, 4,287,565, Cl. 364-580.000.
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Schulz, Alfred: *See—*
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Schulz, John C., to J. I. Case Company. Stabilizer assembly. 4,286,803, Cl. 280-764.000.
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Wagner, Fritz; Rapp, Peter; Bock, Hans; Lindorfer, Walter; Schulz, Walther; and Gebetsberger, Wilhelm, 4,286,660, Cl. 166-246.000.
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Schumacher, Gustav, II; and Schumacher, Gunter, 4,286,425, Cl. 56-307.000.
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Schutz, Udo. Composite steel-jacketed plastic barrel. 4,286,723, Cl. 220-5.00R.
Schwab, Carl E.; Foley, Peter; and Caputo, Charles A., to General Signal Corporation. Apparatus for recording and playing back radar video with conventional video recorder. 4,287,533, Cl. 358-127.000.
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Haubner, Georg; Wesemeyer, Jurgen; Schrumpf, Hans; Birmelin, Jorg; Schwab, Manfred; Honig, Gunter; Kiencke, Uwe; Schulz, Alfred; and Meier, Werner, 4,287,565, Cl. 364-580.000.
Schwartz, Andrew M.: *See—*
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MacPherson, James A.; and Schwartz, Joseph, 4,286,400, Cl. 40-152.000.
Schwartz, Reinhard: *See—*
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Schwarz, Rudolf: *See—*
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Scifres, Donald R. Liquid-level monitor. 4,287,427, Cl. 250-577.000.
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Lee, Maw H.; and Keim, John E., 4,287,464, Cl. 318-80[illegible]0.
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Scott, David R.; and Rhoades, Thomas S., 4,287,511, Cl. 340-541.000.
Scovill Inc.: *See—*
Stevens, William E., 4,286,412, Cl. 49-379.000.
Sea Savory, Inc.: *See—*
Wenstrom, Richard T., 4,286,356, Cl. 17-46.000.
Searcy, James A.; Zoellner, Roger O.; and Hoffmann, Ronald C., to Cambridge Engineering, Inc. Ventilating hood. 4,286,572, Cl. 126-299.00D.
Searle, Kenneth L.: *See—*
Melitz, Daniel T.; Searle, Kenneth L.; and Woodman, Brian E., 4,286,896, Cl. 405-185.000.
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Sears, I. Weir, Jr.; and Quertain, Raoul, 4,287,143, Cl. 264-46.800.
Seckendorf, Bernard A., to Wrist-A-Matic, Ltd. Magnet-actuable flash apparatus. 4,286,854, Cl. 354-129.000.
Seco Manufacturing, Inc.: *See—*
Stong, Jack V., 4,286,691, Cl. 184-7.0CR.
Seebo, Thomas C., II. Combination staircase and attic fan means. 4,286,508, Cl. 98-43.00R.
Seed, Brian S. Polyfunctional epoxides and halohydrins used as bridging groups to bind aromatic amine group-containing alcohols and thiols to hydroxyl bearing substrates. 4,286,964, Cl. 23-230.00B.
Segner, Samuel M., to United States of America, Army. Multiple access, time-division multiplex, satellite communications system. 4,287,588, Cl. 370-29.000.
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Ogihara, Masuo; Chimura, Kozo; Shinozaki, Nobuo; and Seki, Yoichi, 4,287,586, Cl. 368-222.000.
Seiler, Erhard: *See—*
Theysohn, Rainer; Zeitler, Gerhard; Weiss, Frank; Willing, Hans; and Seiler, Erhard, 4,287,117, Cl. 260-42.460.
Seki, Yoichi: *See—*
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Sekigawa, Fujio: *See—*
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Selman, Charles M., to Phillips Petroleum Co. Polymerization catalysts. 4,287,091, Cl. 252-429.00B.
Selvin, Gerald J.: *See—*
Goodman, David S.; Selvin, Gerald J.; Dubell, Edward G.; Doty, Donald J.; Erbe, Alfred R.; and Wilson, Robert E., 4,286,834, Cl. 339-16.00R.
Semenov, Valentin P.: *See—*
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Bashnin, Oleg I.; Semenov, Vasily V.; Fedorov, Vasily N.; Rodionov, Evgeny I.; Davidson, Boris A.; and Schegolev, Gleb S., 4,287,429, Cl. 290-40.00C.
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Holtje, Wilfried G.; Senkler, George H.; and Taggi, Arthur J., 4,286,998, Cl. 106-288.00Q.
Senoo, Keizi: *See—*
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Okada, Toshio; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, 4,287,272, Cl. 429-144.000.
Sensibar, Ezra, to David Sensibar Irrevocable Trust. Valve position detecting apparatus. 4,287,432, Cl. 307-116.000.
Seperef - TMP Societe pour l'Equipment des Reseaux en Canalisations de Matieres Plastiques: *See—*
Prudhomme, Pierre; Lafaye, Jean-Jacques; and Rey, Raymond, 4,287,237, Cl. 427-238.000.
Service (Engineers) Limited: *See—*
Ryckman, George, 4,286,938, Cl. 425-265.000.
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Hess, Hans-Jurgen E.; Bindra, Jasjit S.; and Shah, Praful K., 4,287,341, Cl. 544-285.000.
Shamah, Alfred A. Ratchet-securable toggle retainer. 4,286,497, Cl. 411-342.000.
Shannon, Jefferson C. Implement transporter. 4,286,918, Cl. 414-742.000.
Shapiro, Stanley L.: *See—*
Clark, John H.; Campillo, Anthony J.; Shapiro, Stanley L.; and Winn, Kenneth R., 4,287,035, Cl. 204-157.10R.
Sharp Kabushiki Kaisha: *See—*
Tagawa, Takao, 4,287,525, Cl. 346-155.000.
Takeda, Mikio; Kishishita, Hiroshi; Kawabata, Hiroyuki; and Isaka, Kinichi, 4,287,449, Cl. 313-509.300.
Tanimoto, Akira; and Saizi, Mituhiro, 4,287,584, Cl. 368-63.000.
Shaw, Edward A.: *See—*
Molloy, Normand, 4,286,531, Cl. 112-121.150.
Shell Oil Company: *See—*
Johnson, Henry W., Jr., 4,286,457, Cl. 73-53.000.
Shelton, John J., to Nelson, Robert T. Blasting machine with position sensing and adjustment. 4,286,417, Cl. 51-415.000.

Sherman, Robert. Dimmer control system. 4,287,468, Cl. 323-322.000.
Shevels, Thomas F.: *See—*
Harris, Norman; and Shevels, Thomas F., 4,287,369, Cl. 568-454.000.
Harris, Norman; Dennis, Alan J.; and Shevels, Thomas F., 4,287,370, Cl. 568-454.000.
Shiba, Yoshiro: *See—*
Monden, Takeshi; Shiba, Yoshiro; Momonaka, Toshihiro; Kobayashi, Shigeru; and Oda, Kazuo, 4,287,242, Cl. 427-426.000.
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Celmer, Walter D.; Cullen, Walter P.; Huang, Liang H.; Oscarson, John R.; Shibakawa, Riichiro; and Tone, Junsuke, 4,287,182, Cl. 424-118.000.
Shiga, Tetsuo: *See—*
Nonaka, Kohei; Koyama, Masahiro; Gonmori, Makoto; Kimura, Takeo; and Shiga, Tetsuo, 4,287,295, Cl. 430-349.000.
Shimada, Katsutoshi: *See—*
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Shimamura, Kouichi, to Sonix Limited. Plating process. 4,287,029, Cl. 204-15.000.
Shimano Industrial Company Limited: *See—*
Shimano, Keizo, 4,286,953, Cl. 474-80.000.
Shimano, Keizo, to Shimano Industrial Company Limited. Bicycle derailleur having an improved mechanism for swinging a chain guide. 4,286,953, Cl. 474-80.000.
Shimazu, Katashi: *See—*
Tomita, Chuji; Abe, Hiroshi; and Shimazu, Katashi, 4,287,424, Cl. 250-445.00T.
Shimizu, Hideo: *See—*
Murakami, Ryoichi; Shimizu, Hideo; and Sato, Syuzi, 4,287,004, Cl. 148-6.15R.
Shimizu, Isoo; Tsuji, Okitsugu; Matsuzaka, Eiichi; and Sato, Atsushi, to Nippon Petrochemicals Co., Ltd. Method for aralkylation. 4,287,376, Cl. 585-458.000.
Shimizu, Masami: *See—*
Uchidoi, Masanori; Shimizu, Masami; Date, Nobuaki; and Aizawa, Hiroshi, 4,286,849, Cl. 354-23.00D.
Shimoi, Masahiro: *See—*
Takashina, Naomitsu; Shimoi, Masahiro; and Iwamoto, Yoshinori, 4,287,113, Cl. 260-33.4EP.
Shimotori, Kazumi: *See—*
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Shin-Etsu Chemical Co., Ltd.: *See—*
Itoh, Kunio; Fukuda, Takeshi; and Matumura, Masaaki, 4,287,114, Cl. 260-37.0SB.
Tonedachi, Masayuki; Sekigawa, Fujio; and Minemura, Katsuyoshi, 4,287,221, Cl. 427-3.000.
Shin Gijutsu Kigyo Kabushiki Kaisha: *See—*
Nakanishi, Kisaku, 4,286,666, Cl. 168-4.000.
Shin, Paik W.: *See—*
Torok, Theodore E.; Shin, Paik W.; and Borzillo, Angelo R., 4,287,008, Cl. 148-127.000.
Shinano Tokki Corporation: *See—*
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Shinkai, Ichiro: *See—*
Liu, Thomas M. H.; Melillo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and Sletzinger, Meyer, 4,287,123, Cl. 260-239.00A.
Shinomiya, Masami: *See—*
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Shinozaki, Nobuo: *See—*
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Shinozaki, Sohji: *See—*
Ohta, Tatsuo; Shinozaki, Sohji; Yoshida, Syusaku; and Ohba, Hideo, 4,287,278, Cl. 430-53.000.
Shionogi & Co., Ltd.: *See—*
Sonoyama, Takayasu; Tani, Hiroyoshi; and Kobayashi, Kobee, 4,287,137, Cl. 261-93.000.
Shionozaki, Yoshio: *See—*
Takei, Katsumori; Kanbe, Sadao; and Shionozaki, Yoshio, 4,287,085, Cl. 252-299.630.
Shipman, Ronald L., to Lenco, Inc. Valve for a sandblasting device. 4,286,755, Cl. 239-530.000.
Shirakura, Toshiharu: *See—*
Kuwabara, Kouji; Sugawara, Hiroyuki; Shirakura, Toshiharu; Sasaki, Kouji; and Takemori, Satoshi, 4,287,487, Cl. 331-94.50G.
Shirasaka, Hisatoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Function test evaluation apparatus for evaluating a function test of a logical circuit. 4,287,594, Cl. 371-25.000.
Shoji, Masashi: *See—*
Fukaya, Hirokazu; and Shoji, Masashi, 4,287,390, Cl. 179-1.00A.
Shulman, Alexandr Y.: *See—*
Divin, Jury Y.; Polyansky, Oleg J.; and Shulman, Alexandr Y., 4,287,418, Cl. 250-336.000.
Shuster, Edward J.: *See—*
Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, 4,287,081, Cl. 252-174.110.
Sides, Nathan T.; and Daugherty, Thomas L., to United States of America, Navy. Offset-pad bearing. 4,286,828, Cl. 308-26.000.
Sieber, William J.: *See—*
Ziv, Avraham; Tanaka, Akira; Hollowell, William; Sieber, William J.; and Ahad, Munir J., 4,287,398, Cl. 200-61.45R.
Siegemund, Gunter; and Muffler, Herbert, to Hoechst Aktiengesellschaft. Process for the preparation of 4,5-perfluoro-1,3-dioxalanes. 4,287,124, Cl. 260-340.90R.
Siegwarth, Martin, to Richard Hirschmann Radiotechnisches Werk. Electronic signal generator with periodically varying frequency. 4,287,510, Cl. 340-384.00E.
Siemens Aktiengesellschaft: *See—*
Eckert, Werner; and Simon, Wolfgang, 4,287,043, Cl. 204-228.000.
Hahndorff, Axel, 4,287,548, Cl. 361-120.000.
Kuphal, Wilko; and Wons, Heinz, 4,287,422, Cl. 250-439.00R.
Rubner, Roland; Kuhn, Eberhard; and Ahne, Hellmut, 4,287,294, Cl. 430-306.000.
Strehl, Herbert, 4,287,591, Cl. 370-83.000.
Vanhumbeeck, Jacky; De Steur, Hubert; Heyneman, Guido; and Vandenbossche, Chris, 4,286,965, Cl. 23-230.00A.
Wiechert, Edelbert, 4,287,399, Cl. 200-153.00T.
Sieving, Alfred W., to Caterpillar Tractor Co. Fabricated heavy-duty industrial wheel. 4,286,825, Cl. 301-63.00R.
Siggelin, Lars: *See—*
Axelsson, Holger; and Siggelin, Lars, 4,286,413, Cl. 51-3.000.
Sih, John C., to Upjohn Company, The. 13,14-Dihydro-inter-oxa-9-deoxy-9-methylene-19-oxo-PGF_1 compounds. 4,287,358, Cl. 562-503.000.
Sih, John C., to Upjohn Company, The. 13,14-Dihydro-inter-oxa-11-deoxy-11-hydroxymethyl-19-oxo-PGF_1 compounds. 4,287,359, Cl. 562-503.000.
Sih, John C., to Upjohn Company, The. 13,14-Dihydro-inter-oxa-11-deoxy-11-hydroxymethyl-19-oxo-PGE_1 compounds. 4,287,360, Cl. 562-503.000.
Sih, John C., to Upjohn Company, The. 13,14-Dihydro-inter-oxa-11-deoxy-19-oxo-PGF_1 compounds. 4,287,361, Cl. 562-503.000.
Siklosi, Michael P., to Procter & Gamble Company, The. Detergent compositions which contain certain tertiary alcohols. 4,287,080, Cl. 252-104.000.
Siladi, Kim E.: *See—*
Stelben, John J.; Siladi, Kim E.; Herman, George A., Jr.; and Vesel, John E., 4,286,866, Cl. 355-14.00D.
Silcott, Philip B.; and Stubbings, James H., to Potomac Applied Mechanics. Convertible back pack frame. 4,286,739, Cl. 224-156.000.
Sills, William G. Padlock protective cover. 4,286,445, Cl. 70-55.000.
Silver Systems, Ltd.: *See—*
Biles, Don L.; and Richardson, A. Alan, 4,287,044, Cl. 204-231.000.
Silverberg, Morton, to Xerox Corporation. Document belt with discrete vacuum areas. 4,286,870, Cl. 355-76.000.
Simes, S.p.A.: *See—*
Ferrari, Giorgio; and Vecchietti, Vittorio, 4,287,211, Cl. 424-322.000.
Simington, Jack F.; and Ray, William E. Mechanical roping steer. 4,286,788, Cl. 273-359.000.
Simom S.A.: *See—*
Pfau, Paul; Fausel, Thomas E.; and Grunder, Arthur, 4,287,537, Cl. 358-299.000.
Simon Engineering Dudly Limited: *See—*
Ashworth, Denis H., 4,286,721, Cl. 212-199.000.
Simon, Eric: *See—*
Buckwalter, Geoffrey R., 4,287,000, Cl. 106-309.000.
Simon, Ernst-Ulrich; and Ullrich, Horst, to VDO Adolf Schindling AG. Warning device with central indication of operating conditions to be monitored in motor vehicles. 4,287,504, Cl. 340-52.00F.
Simon, Pierre; and Dreux, Jacques, to Laboratoires Hoechst, S.A. Halogen derivatives of 8-hydroxycarboxylic acids; the processes for their preparation and medicaments in which they are present. 4,287,206, Cl. 424-279.000.
Simon, Wolfgang: *See—*
Eckert, Werner; and Simon, Wolfgang, 4,287,043, Cl. 204-228.000.
Simonacco Limited: *See—*
Menzies, James D., 4,286,707, Cl. 198-859.000.
Simpson, Charles J.: *See—*
Rabelos, Nicholas A., 4,286,526, Cl. 109-73.000.
Sims, Larry A.; Lambert, Gerald L.; Gross, Raymond J.; and Collins, Harold B., to Mattel, Inc. Spinning top pinball-type game. 4,286,406, Cl. 46-72.000.
Simshauser, Elvin D.; and Nosker, Richard W., to RCA Corporation. Signal loss dectector for video disc. 4,287,587, Cl. 369-50.000.
Sipca Holding S.A.: *See—*
Amon, Albert; Weil, Roger; and Heinzer, Paul, 4,287,234, Cl. 427-150.000.
Sirkar, Amalesh K., to Hydrocarbon Research, Inc. Multi-stage fluidization and segregation of used catalyst fractions. 4,287,088, Cl. 252-414.000.
Siryj, Bohdan W.; and Gilson, Alan P., to RCA Corporation. Optical disc changer apparatus. 4,286,790, Cl. 369-36.000.
Sisti, Giorgio; Riva, Ermete; and Sala, Learco, to Carlo Erba Strumentazione S.p.A. Gas chromatographic chamber. 4,286,456, Cl. 73-23.100.
Sitnam, Elmo. Solar collector. 4,286,580, Cl. 126-438.000.
SKF Industrial Trading & Development Co. B. V.: *See—*
Heemskerk, Rutgerus S., 4,286,829, Cl. 308-187.000.
Skiles, Jerry W.: *See—*
Suh, John T.; Williams, Bruce E.; Skiles, Jerry W.; and Loev, Bernard, 4,287,203, Cl. 424-275.000.
Skobel, Max, to Laurel Enterprises. Jewelry clasp. 4,286,360, Cl. 24-230.00R.
Skoda, William G.; and Luff, Marlin, to Motorola, Inc. Crystal holder for different sizes of crystal. 4,287,447, Cl. 310-348.000.

Skoumal, Donald E.: *See—*
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Sletzinger, Meyer: *See—*
Liu, Thomas M. H.; Melillo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and Sletzinger, Meyer, 4,287,123, Cl. 260-239.00A.
Smiley, Robert A., to Du Pont de Nemours, E. I., and Company. Purification of acetonitrile by caustic extraction. 4,287,134, Cl. 260-465.100.
Smith, Edwyn D., to United States of America, Army. Correlated double sampling CCD video preprocessor-amplifier. 4,287,441, Cl. 307-353.000.
Smith, Francis H.; and Gale, Richard W., to Vickers Limited. Diffractometer. 4,286,874, Cl. 356-338.000.
Smith, Francis H., to Vickers Limited. Diffractometer. 4,286,875, Cl. 356-338.000.
Smith, Gary R., to Smith R.P.M. Corporation. Offset litho conversion from letterpress equipment. 4,286,519, Cl. 101-138.000.
Smith, Gerald L.: *See—*
Promis, George G.; Smith, Gerald L.; and Wilson, John C., 4,287,461, Cl. 318-571.000.
Smith, James. Automatic spring powered battery charging device. 4,287,428, Cl. 290-1.00E.
Smith-Johannsen, Robert; and Walker, Jack M., to Raychem Corporation. Method of making heater cable of self-limiting conductive extrudates. 4,286,376, Cl. 29-611.000.
Smith, John C.: *See—*
Ibbotson, Peter; Smith, John C.; and Frodsham, Colin, 4,287,274, Cl. 429-156.000.
Smith Kline & French Laboratories Limited: *See—*
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,287,198, Cl. 424-263.000.
Smith R.P.M. Corporation: *See—*
Smith, Gary R., 4,286,519, Cl. 101-138.000.
Smith, Raymond, to Teledyne Industries, Inc. Gas turbine engine. 4,286,430, Cl. 60-39.16R.
Smith, Richard E.; and Burke, William R., to National Gypsum Company. Mica-free joint compound. 4,286,995, Cl. 106-109.000.
Sneider, Vincent R. Squeeze dispenser with flexible conduit with attached, weighted and grooved end. 4,286,735, Cl. 222-189.000.
Snia Viscosa: *See—*
Cazzaro, Giorgio; Matera, Giancarlo; Cavallaro, Antonino; and Zani, Marina, 4,287,148, Cl. 264-182.000.
Snow Biz, Inc.: *See—*
Booty, Donald J., 4,286,397, Cl. 36-132.000.
Snyder, Clinton D.: *See—*
Kadehjian, Leo J.; Sachdev, Harbans S.; and Snyder, Clinton D., 4,286,989, Cl. 106-22.000.
Snyder, Ralph C. Spouting ice protectors. 4,286,418, Cl. 52-11.000.
Societe Anonyme Automobiles Citroen: *See—*
Roche, Alain-Gilbert, 4,286,802, Cl. 280-693.000.
Societe Anonyme D.B.A.: *See—*
Carre, Jean-Jacques; and Levrai, Roland, 4,286,504, Cl. 91-517.000.
Morin, Gerard, 4,286,363, Cl. 29-149.50B.
Societe de Recherches Industrielles (S.O.R.I.): *See—*
Majoie, Bernard, 4,287,209, Cl. 424-308.000.
Societe d'Etude et de Construction de Machines pour Toutes Industries SECOMA: *See—*
Benichou, Alain; and Perraud, Raymond J., 4,286,899, Cl. 405-260.000.
Societe Europeene de Propulsion: *See—*
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Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Dehan, Gerard C. H.; and Maulat, Jean-Pierre, 4,286,473, Cl. 74-107.000.
Societe Nationale Elf Aquitaine (Production): *See—*
Bres, Philippe; Berge, Christian; and Sassus-Bourda, Gerard, 4,286,461, Cl. 73-155.000.
Miffre, Hubert, 4,286,663, Cl. 166-325.000.
Solid Photography, Inc.: *See—*
Stern, Howard; and DiMatteo, Paul, 4,286,852, Cl. 354-77.000.
Solomin, Vladimir A.: *See—*
Popov, Alexandr D.; Solomin, Vladimir A.; Teptikov, Nikolai R.; and Demchenko, Jury D., 4,287,444, Cl. 310-13.000.
Somm, Franz: *See—*
Buser, Rolf; Palacin, Francis; Robert, Georg; and Somm, Franz, 4,286,961, Cl. 8-532.000.
Sommers, Philip B. Specimen transfer rack. 4,287,154, Cl. 422-64.000.
Sonix Limited: *See—*
Shimamura, Kouichi, 4,287,029, Cl. 204-15.000.
Sonoco Products Company: *See—*
McMahon, Edward H., Jr.; and Abston, J. B., 4,287,244, Cl. 428-35.000.
Sonoyama, Takayasu; Tani, Hiroyoshi; and Kobayashi, Kobee, to Shionogi & Co., Ltd. Vane-type fluid impeller and method of aerating a liquid. 4,287,137, Cl. 261-93.000.
Sony Corporation: *See—*
Mitamura, Ichiro; Tooyama, Akira; and Hosono, Takashi, 4,287,531, Cl. 358-67.000.
Nakamura, Tadahiko; and Nakano, Kenji, 4,287,458, Cl. 318-341.000.
Okuda, Hiroshi, 4,287,542, Cl. 360-105.000.
Sakamoto, Hitoshi; and Wakisaka, Yoshiaki, 4,287,538, Cl. 360-10.000.
Tanahashi, Makoto; Yamauchi, Hisashi; and Yamamoto, Takeshi, 4,287,541, Cl. 360-92.000.
Tatami, Mitsushige; and Tsujikawa, Kazunobu, 4,287,529, Cl. 358-8.000.
Soo, Suk S.; and Schwartz, Andrew M., to International Business Machines Corp. Illumination and pick up apparatus. 4,287,414, Cl. 250-227.000.
Sorenson, Roderick J.: *See—*
Tinney, Francis J.; Connor, David T.; Cetenko, Wiaczeslaw A.; Kerbleski, Joseph J.; and Sorenson, Roderick J., 4,287,340, Cl. 544-250.000.
Soula, Gerard, to Rhone-Poulenc Industries. Preparation of benzenoid ethers and thioethers. 4,287,125, Cl. 260-340.90R.
South African Inventions Development Corporation, The: *See—*
Coetzer, Johan, 4,287,268, Cl. 429-103.000.
Coetzer, Johan; and Thackeray, Michael M., 4,287,269, Cl. 429-103.000.
Coetzer, Johan; Nolte, Margaretha J.; and de Kocknee Steynberg, Annemare, 4,287,271, Cl. 429-103.000.
Southwire Company: *See—*
Rowe, Joseph R.; and Sanders, Eugene T., 4,286,913, Cl. 414-422.000.
Spangler, Michael J.: *See—*
Michaels, Glenn O.; and Spangler, Michael J., 4,287,327, Cl. 526-86.000.
Spanides, Moschoula. Faucet control device. 4,286,623, Cl. 137-597.000.
Spencer, Donald L.; and Melroy, Patrick J., to University of Iowa Research Foundation, The. Apparatus for containing liquid. 4,286,577, Cl. 126-429.000.
Spengler, Ernst M., to Stanztechnik GmbH R & S. Force application apparatus. 4,286,490, Cl. 83-453.000.
Sperry Corporation: *See—*
Lienau, Mark H., 4,287,445, Cl. 310-13.000.
Swift, Billy K.; Zizzo, Anthony F.; and Blevins, Willard A., 4,287,480, Cl. 331-1.00A.
Spevak, Stephen T., to Potomac Applied Mechanics, Inc. Article supporting assembly. 4,286,832, Cl. 312-283.000.
Spin Physics, Inc.: *See—*
Bixby, James A.; Lemke, James U.; and Lentz, Robert A., 4,287,539, Cl. 360-18.000.
Spinks, Brian M.; and Dumas, John R., to Motorola, Inc. Edge sense latch. 4,287,442, Cl. 307-510.000.
Spiva, Stephan D.: *See—*
Harvey, Leslie E.; and Spiva, Stephan D., 4,286,784, Cl. 273-54.00D.
Spoormaker, Arie W.: *See—*
Vosper, Ralph R.; Spoormaker, Arie W.; Binasik, Chester S.; and Harthun, Norman E., 4,286,945, Cl. 432-29.000.
Spreafico, Bruno. Machine for mechanical pickling of wires with the aid of rolling. 4,286,449, Cl. 72-40.000.
Sprecker, Mark A.; Sanders, James M.; Schreiber, William L.; Watkins, Hugh; Vinals, Joaquin F.; Shuster, Edward J.; O'Rourke, Thomas J.; Hagedorn, Myrna L.; and Klemarczyk, Philip, to International Flavors & Fragrances Inc. Bridged ketones, process for preparing same and use thereof in augmenting or enhancing the organoleptic properties of consumable materials. 4,287,081, Cl. 252-174.110.
Sprecker, Mark A.; Trenkle, Robert W.; Mookherjee, Braja D.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; and Schmitt, Frederick L., to International Flavors & Fragrances Inc. 6-Hydroxy-2,6-dimethylheptanal, organoleptic uses thereof and processes for preparing the same. 4,287,133, Cl. 260-458.00R.
Sprekeler, Otto G. G., to Whitco Pty. Ltd. Security screen door lock. 4,286,812, Cl. 292-245.000.
Spycher, Anton A.: *See—*
Gulati, Suresh T.; and Spycher, Anton A., 4,287,018, Cl. 156-645.000.
SRI International: *See—*
Crane, Hewitt D.; and Steele, Carroll M., 4,287,410, Cl. 250-201.000.
Stafford, Donald C., to Chicago Bridge & Iron Company. Releasable connection. 4,286,898, Cl. 405-224.000.
Stamicarbon, B.V.: *See—*
van Gasse, Rene L. E., 4,287,310, Cl. 525-44.000.
Standard Oil Company (Indiana): *See—*
Fields, Ellis K., 4,287,349, Cl. 548-166.000.
Michaels, Glenn O.; and Spangler, Michael J., 4,287,327, Cl. 526-86.000.
Standard-Thomson Corporation: *See—*
Wong, Backman; and Wilson, Earl L., 4,286,750, Cl. 236-34.500.
Standiford, Ferris C. Apparatus and method for adiabatic flashing of liquids. 4,287,019, Cl. 159-2.0MS.
Standish, Thomas R., to Delta-X Corporation. Control circuit for shutting off the electrical power to a liquid well pump. 4,286,925, Cl. 417-12.000.
Stanley, Bedford F. Portable sink top water conditioner. 4,287,057, Cl. 210-85.000.
Stanley Works, The: *See—*
Di Diego, Robert, 4,286,387, Cl. 33-138.000.
Stanztechnik GmbH R & S: *See—*
Spengler, Ernst M., 4,286,490, Cl. 83-453.000.
Stark, Moshe, to Intel Corporation. Multiple bit read-only memory cell and its sense amplifier. 4,287,570, Cl. 365-104.000.
State Wide Aluminum of Indiana, Inc.: *See—*
McGaughey, Donald C., 4,286,820, Cl. 296-146.000.

Stavros, Anthony J., to Bethlehem Steel Corporation. Protective atmosphere gas wiping apparatus and method of using. 4,287,238, Cl. 427-349.000.

Steck, Werner: *See—*
Rudolf, Peter; Steck, Werner; Koester, Eberhard; Ohlinger, Manfred; and Jaeckh, Christof, 4,287,233, Cl. 427-127.000.

Steele, Carroll M.: *See—*
Crane, Hewitt D.; and Steele, Carroll M., 4,287,410, Cl. 250-201.000.

Steiger, Douglass W.; and Kees, Edward J., to Environmental Impact Research Group. Geothermal heating system and method of installing the same. 4,286,651, Cl. 165-45.000.

Stelben, John J.; Siladi, Kim E.; Herman, George A., Jr.; and Vesel, John E., to Pitney Bowes Inc. Bias voltage control for electrophotocopier magnetic brush. 4,286,866, Cl. 355-14.00D.

Stendel, Wilhelm: *See—*
Fuchs, Rainer; Hammann, Ingeborg; Homeyer, Bernhard; Behrenz, Wolfgang; and Stendel, Wilhelm, 4,287,208, Cl. 424-304.000.

Stenzel, Wallace I., to Waukee Engineering Company Inc. Apparatus for separating liquids. 4,287,063, Cl. 210-402.000.

Stern, Howard; and DiMatteo, Paul, to Solid Photography, Inc. Recording images of a three-dimensional surface by focusing on a plane of light irradiating the surface. 4,286,852, Cl. 354-77.000.

Stevens, William E., to Scovill Inc. Hold-open device for use with conventional door closer. 4,286,412, Cl. 49-379.000.

Stevenson, James F.: *See—*
Fairbanks, Richard E.; Stevenson, James F.; and Blumenfeld, John F., 4,287,380, Cl. 13-6.000.

Stevenson, Robert L., to Havaco Incorporated. Rotary control valve for expansion fluid driven engines. 4,286,500, Cl. 91-180.000.

Stewart, Charles; and Condon, Richard W., to Roper Corporation. Motorized ski bob. 4,286,682, Cl. 180-9.24A.

Stewart, Patrick H.; and Woodson, Wayne D., to CL Industries, Inc. Acid catalysis of resin foundry binders. 4,287,092, Cl. 252-429.00R.

Stewart, Ralph J., to International Business Machines Corporation. Method and apparatus for pneumatically sampling powders. 4,286,466, Cl. 73-863.830.

Stiff, Bernard. Rotary shaft control apparatus. 4,286,476, Cl. 74-640.000.

Stilling, Johann. Strut raceways for sign boxes. 4,287,555, Cl. 362-225.000.

Stober, Reinhard; Wirthwein, Rolf; and Hase, Christian. Stabilized diperoxyalkanedioic acids and aromatic peroxycarboxylic acids. 4,287,135, Cl. 260-502.00R.

Stockley, Raymond A.: *See—*
Porter, L. Steven; and Stockley, Raymond A., 4,286,904, Cl. 408-225.000.

Stoldt, Stephen H.: *See—*
Kestner, Mark O.; and Stoldt, Stephen H., 4,287,236, Cl. 427-221.000.

Stoltman, Donald D., to General Motors Corporation. Engine charge forming apparatus. 4,286,562, Cl. 123-454.000.

Stong, Jack V., to Seco Manufacturing, Inc. Truck lubricator. 4,286,691, Cl. 184-7.0CR.

Stoudt, Thomas H.: *See—*
Carlo, Dennis J.; Jackson, Jesse J.; and Stoudt, Thomas H., 4,287,173, Cl. 424-49.000.

Stover, Harris A., to United States of America, Army. Preservation of equal time delays for different paths through digital communications repeaters. 4,287,593, Cl. 370-103.000.

Strachan, Robert; and Goodhouse, Carl J., to Robertshaw Controls Company. Control panel unit and timer unit and method therefor. 4,287,583, Cl. 368-10.000.

Strandly, Ingvald. Method of providing a seam in double-layer forming fabrics. 4,286,631, Cl. 139-383.00A.

Straus, Albert E., to Hoover Universal, Inc. Ballcock assembly. 4,286,619, Cl. 137-426.000.

Strazzari, Giuliano: *See—*
Martelli, Nerio; and Strazzari, Giuliano, 4,286,715, Cl. 206-564.000.

Strehl, Herbert, to Siemens Aktiengesellschaft. Communications transmission system. 4,287,591, Cl. 370-83.000.

Streib, Hugo: *See—*
Engelhard, Forest; Kuhn, Rainer; Pump, Wichard; Riess, Reinhard; and Streib, Hugo, 4,287,262, Cl. 428-461.000.

Streich, Steven G.; and Knox, Lloyd C., to Halliburton Company. Removable plug. 4,286,629, Cl. 138-89.000.

Stringer, Frederick D.: *See—*
Esakov, Michael D.; Hudgens, David C., Jr.; and Stringer, Frederick D., 4,287,151, Cl. 264-560.000.

Strohmeyer, Max: *See—*
Brunner, Erwin; Schubert, Eckart; Lindner, Alfred; Merger, Franz; Volkamer, Klaus; Strohmeyer, Max; and Sandrock, Gerhard, 4,287,379, Cl. 585-839.000.

Stubbings, James H.: *See—*
Silcott, Philip B.; and Stubbings, James H., 4,286,739, Cl. 224-156.000.

Stumpp, Gerhard; and Wessel, Wolf, to Robert Bosch GmbH. Apparatus for measuring the amount of fluid supplied by a fluid supply device. 4,286,615, Cl. 137-117.000.

Stumvoll, Ernst: *See—*
Greutert, Albert; and Stumvoll, Ernst, 4,287,066, Cl. 210-464.000.

Su, Sophia R.: *See—*
Natansohn, Samuel; and Su, Sophia R., 4,287,159, Cl. 423-54.000.

Sugawara, Hiroyuki: *See—*
Kuwabara, Kouji; Sugawara, Hiroyuki; Shirakura, Toshiharu; Sasaki, Kouji; and Takemori, Satoshi, 4,287,487, Cl. 331-94.50G.

Sugimoto, Akira; and Sugimoto, Hiroshi, to Tokyo Chika Koji Kabushiki Kaisha. Injection device of chemical fluids for improvements of the ground. 4,286,900, Cl. 405-269.000.

Sugimoto, Hiroshi: *See—*
Sugimoto, Akira; and Sugimoto, Hiroshi, 4,286,900, Cl. 405-269.000.

Sugo, Takanobu: *See—*
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Okada, Toshio; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, 4,287,272, Cl. 429-144.000.

Suh, John T.; Williams, Bruce E.; Skiles, Jerry W.; and Loev, Bernard, to USV Pharmaceutical Corporation. Antihypertensive 1,4-thiazepine-ones, 1,4-thiazonine-ones, and method of use thereof. 4,287,203, Cl. 424-275.000.

Sulzer, Harry E., to Anchor/Darling Industries, Inc. Mechanical snubber. 4,286,693, Cl. 188-378.000.

Sumida, Shizuo, to Toyo Kogyo Co., Ltd. Running data central display arrangement for motor vehicles and the like. 4,287,503, Cl. 340-52.00F.

Sumitomo Chemical Company, Limited: *See—*
Kitagawa, Yoshihiko; Hanamura, Yoshimi; Yuyama, Masahiro; Moritani, Masahiko; Sakuramoto, Akira; and Suzuki, Mikio, 4,287,317, Cl. 525-309.000.
Takagishi, Hisao; and Kondo, Norio, 4,287,110, Cl. 260-29.2EP.

Sumitomo Electric Industries, Ltd.: *See—*
Saito, Yasunori, 4,287,384, Cl. 174-29.000.

Sun Oil Company of Pennsylvania: *See—*
Earhart, Harold W.; and Rugen, Donald F., 4,287,074, Cl. 585-6.300.
Hamlin, Robert N.; and Dickinson, William W., 4,286,973, Cl. 55-92.000.

Suntech, Inc.: *See—*
Scheibel, Edward G., 4,287,162, Cl. 423-238.000.

Suntory Ltd.: *See—*
Toyoshima, Kumao; Hakura, Akira; Nakanishi, Toshihiro; and Yoshizumi, Hajime, 4,287,185, Cl. 424-177.000.

Superior Industries International, Inc.: *See—*
Brown, Raymond C., 4,286,824, Cl. 301-37.0SS.

Sureau, Robert F. M.: *See—*
Pechmeze, Jacques P. E.; and Sureau, Robert F. M., 4,287,121, Cl. 260-186.000.

Suskind, Philip A. Dock clamp apparatus. 4,286,897, Cl. 405-221.000.

Sutherland, Ian A., to National Research Development Corporation. Rotating coil centrifuge. 4,287,061, Cl. 210-198.200.

Suzuki, Katumi: *See—*
Yusa, Haruhiko; Oota, Masanori; and Suzuki, Katumi, 4,287,312, Cl. 525-83.000.

Suzuki, Masayasu: *See—*
Kaneko, Akira; Ohya, Masaki; Suzuki, Masayasu; and Kobayashi, Akio, 4,287,316, Cl. 525-296.000.

Suzuki, Mikio: *See—*
Kitagawa, Yoshihiko; Hanamura, Yoshimi; Yuyama, Masahiro; Moritani, Masahiko; Sakuramoto, Akira; and Suzuki, Mikio, 4,287,317, Cl. 525-309.000.

Suzuki, Takayoshi: *See—*
Nakashima, Toshihide; Nakaji, Osamu; Takakura, Koichi; and Suzuki, Takayoshi, 4,287,177, Cl. 424-81.000.

Swain, James W.; and Crayton, Frank H., to Philip Morris Incorporated. Tobacco flavorants. 4,286,606, Cl. 131-276.000.

Swan, John: *See—*
Bedient, Marvin J., 4,286,617, Cl. 137-334.000.

Swenson, Donald A.: *See—*
Brau, Charles A.; Swenson, Donald A.; and Boyd, Thomas J., Jr., 4,287,488, Cl. 331-94.5PE.

Swift, Billy K.; Zizzo, Anthony F.; and Blevins, Willard A., to Sperry Corporation. Phase locked loop out-of-lock detector. 4,287,480, Cl. 331-1.00A.

Swift, Joseph A., to Xerox Corporation. Release agent applicators and method of applying release agent emulsions upon fusers in electrostatic copiers. 4,287,280, Cl. 430-99.000.

Swift, William R.; Herrod, Don W.; and Marsh, James M., to AM International, Inc. Method of correcting for misalignment of microfiche frames. 4,287,564, Cl. 364-525.000.

Sybron Corporation: *See—*
Pietschmann, Helmut, 4,286,948, Cl. 433-77.000.

Syva Company: *See—*
Gibbons, Ian; Rowley, Gerald L.; and Ullman, Edwin F., 4,287,300, Cl. 435-5.000.

Szent-Gyorgyi, Albert; and Fodor, Gabor B., to National Foundation for Cancer Research. Hypotensive and analgesic compounds and compositions and methods for using same. 4,287,205, Cl. 424-278.000.

Szilagyi, Geza: *See—*
Kosa, Edit; Borvendeg, Janos; Huszti, Zsuzsanna; Kosary, Judit; Szilagyi, Geza; Tardos, Laszlo; Kasztreiner, Endre; Nagy, Laszlo; Szuucs, Erzsebet; and Kiss, Gabriella, 4,287,194, Cl. 424-248.510.

Szuucs, Erzsebet: *See—*
Kosa, Edit; Borvendeg, Janos; Huszti, Zsuzsanna; Kosary, Judit; Szilagyi, Geza; Tardos, Laszlo; Kasztreiner, Endre; Nagy, Laszlo; Szuucs, Erzsebet; and Kiss, Gabriella, 4,287,194, Cl. 424-248.510.

Szymski, Eugene J.; and Mraz, Rene, to Excelsior Fitness Equipment Co. Brake flywheel for bicycle-type ergometric exerciser. 4,286,696, Cl. 188-218.00A.

Tabata, Yasuhiro: *See*—
Satomi, Toyokazu; Ohminato, Mitsuru; and Tabata, Yasuhiro, 4,286,865, Cl. 355-14.0CU.
Tabler, Donald C.; and Johnson, Marvin M., to Phillips Petroleum Co. Reclaiming used lubricating oils with ammonium salts and polyhydroxy compounds. 4,287,049, Cl. 208-180.000.
Tachibana, Masami: *See*—
Kikuta, Kazutsune; Tachibana, Masami; and Sato, Akihiro, 4,287,328, Cl. 526-115.000.
Tagawa, Takao, to Sharp Kabushiki Kaisha. Multi-pin record electrode assembly and driving method of the same. 4,287,525, Cl. 346-155.000.
Taggi, Arthur J.: *See*—
Holtje, Wilfried G.; Senkler, George H.; and Taggi, Arthur J., 4,286,998, Cl. 106-288.00Q.
Taguchi, Kiyomi: *See*—
Honda, Akira; Taguchi, Kiyomi; Hanmyo, Masayuki; Ishikawa, Masaru; and Kitamura, Minoru, 4,286,647, Cl. 164-153.000.
Taiho Pharmaceutical Company, Limited: *See*—
Fujmura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,287,207, Cl. 424-282.000.
Takagi, Toshinori; Morimoto, Kiyoshi; and Watanabe, Hiroshi, to Futaba Denshi Kogyo K.K. Apparatus for vapor depositing a stoichiometric compound. 4,286,545, Cl. 118-723.000.
Takagishi, Hisao; and Kondo, Norio, to Sumitomo Chemical Company, Limited. Production of aqueous solutions of cationic thermosetting resins. 4,287,110, Cl. 260-29.2EP.
Takahashi, Nobuo: *See*—
Watanabe, Shotaro; Tomono, Makoto; Yamakawa, Goichi; Nishimura, Takeo; and Takahashi, Nobuo, 4,287,283, Cl. 430-108.000.
Takakura, Koichi: *See*—
Nakashima, Toshihide; Nakaji, Osamu; Takakura, Koichi; and Suzuki, Takayoshi, 4,287,177, Cl. 424-81.000.
Takashina, Naomitsu; Shimoi, Masahiro; and Iwamoto, Yoshinori, to Mitsubishi Gas Chemical Co., Inc. Coating composition. 4,287,113, Cl. 260-33.4EP.
Takeda Chemical Industries, Ltd.: *See*—
Kawamatsu, Yutaka; and Fujita, Takeshi, 4,287,200, Cl. 424-270.000.
Takeda, Mikio; Kishishita, Hiroshi; Kawabata, Hiroyuki; and Isaka, Kinichi, to Sharp Kabushiki Kaisha. Light-absorption film for rear electrodes of electroluminescent display panel. 4,287,449, Cl. 313-509.000.
Takei, Katsumori; Kanbe, Sadao; and Shionozaki, Yoshio, to Kabushiki Kaisha Suwa Seikosha. (2'-Cyano-4'-alkylphenyl)-3-cyano-4-alkoxybenzoates and liquid crystal composition including same. 4,287,085, Cl. 252-299.630.
Takekoshi, Yoshitaka: *See*—
Nozawa, Ryoichiro; Amemiya, Yoichi; Kawamata, Mitsuo; Isohata, Shigeru; Sasaki, Takao; and Takekoshi, Yoshitaka, 4,287,460, Cl. 318-571.000.
Takemori, Satoshi: *See*—
Kuwabara, Kouji; Sugawara, Hiroyuki; Shirakura, Toshiharu; Sasaki, Kouji; and Takemori, Satoshi, 4,287,487, Cl. 331-94.50G.
Takemura, Yoshihiro, to Shinano Tokki Corporation. Electromagnetic rotating apparatus. 4,287,457, Cl. 318-133.000.
Takeshima, Takahiko; Kawashima, Motozo; and Nishimoto, Masayuki, to Ube Industries. Apparatus for operating an injection cylinder of a molding machine. 4,286,648, Cl. 164-312.000.
Takeuchi, Masami: *See*—
Tominaga, Tamotsu; Mihara, Teruyoshi; Oguro, Takeshi; and Takeuchi, Masami, 4,287,501, Cl. 338-42.000.
Takeuchi, Takashi: *See*—
Okuno, Noboru; Takeuchi, Takashi; Tsuzuku, Akihiko; Tanazawa, Masao; Nakajima, Minoru; and Imamura, Haruo, 4,286,935, Cl. 425-72.00R.
Takikawa, Katsuo: *See*—
Fujmura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,287,207, Cl. 424-282.000.
Talbot, Patricia A. Dental floss dispenser. 4,286,611, Cl. 132-91.000.
Tanahashi, Makoto; Yamauchi, Hisashi; and Yamamoto, Takeshi, to Sony Corporation. Cassette loading device for a cassette recording apparatus. 4,287,541, Cl. 360-92.000.
Tanaka, Akira: *See*—
Ziv, Avraham; Tanaka, Akira; Hollowell, William; Sieber, William J.; and Ahad, Munir J., 4,287,398, Cl. 200-61.45R.
Tanaka, Hitoshi: *See*—
Fujiwara, Shinobu; Furukawa, Kiyoshi; Kikuchi, Nobuaki; Iizawa, Osamu; Tanaka, Hitoshi; and Ueoka, Hisayoshi, 4,287,075, Cl. 106-39.500.
Ohmatoi, Susumu; Tanaka, Hitoshi; and Murakami, Seiji, 4,287,257, Cl. 428-403.000.
Tanaka, Satoru; Shimada, Katsutoshi; Hashimoto, Kazunori; Ema, Kiichi; and Udea, Koichiro, to Eisai Co., Ltd. Cyanoguanidine derivatives. 4,287,346, Cl. 546-330.000.
Tanazawa, Masao: *See*—
Okuno, Noboru; Takeuchi, Takashi; Tsuzuku, Akihiko; Tanazawa, Masao; Nakajima, Minoru; and Imamura, Haruo, 4,286,935, Cl. 425-72.00R.
Tani, Hiroyoshi: *See*—
Sonoyama, Takayasu; Tani, Hiroyoshi; and Kobayashi, Kobee, 4,287,137, Cl. 261-93.000.
Taniguchi, Yasuo; Ike, Toshiharu; and Nakaya, Hideo, to Denki Kagaku Kogyo Kabushiki Kaisha. Glue for wood laminating comprising thermosetting condensation resin and modified PVA. 4,287,311, Cl. 525-58.000.
Tanimoto, Akira; and Saizi, Mituhiro, to Sharp Kabushiki Kaisha. Speech-synthesizer timepiece. 4,287,584, Cl. 368-63.000.
Tanso, Shiro: *See*—
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Okada, Toshio; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, 4,287,272, Cl. 429-144.000.
Tardos, Laszlo: *See*—
Kosa, Edit; Borvendeg, Janos; Huszti, Zsuzsanna; Kosary, Judit; Szilagyi, Geza; Tardos, Laszlo; Kasztreiner, Endre; Nagy, Laszlo; Szuucs, Erzsebet; and Kiss, Gabriella, 4,287,194, Cl. 424-248.510.
Tatami, Mitsushige; and Tsujikawa, Kazunobu, to Sony Corporation. Time base error correcting apparatus. 4,287,529, Cl. 358-8.000.
Tauber, Thomas E.; and Magee, James, to Technical Development Company. Optical fluid level monitor. 4,286,464, Cl. 73-293.000.
Tavolek Inc.: *See*—
Amend, Donald F., 4,287,179, Cl. 424-92.000.
Tax, Hans; and Hosler, Klaus, to Tax, Hans. Container loading crane with rotatable hoisting frame. 4,286,722, Cl. 212-242.000.
Taylor, Frank. Compartment cooler. 4,286,440, Cl. 62-457.000.
Taylor, Neil J.; St. Hilaire, A. Robert; and Johnson, James L. Tree stand. 4,286,409, Cl. 47-40.500.
TDK Electronics Co., Ltd.: *See*—
Fujiwara, Shinobu; Furukawa, Kiyoshi; Kikuchi, Nobuaki; Iizawa, Osamu; Tanaka, Hitoshi; and Ueoka, Hisayoshi, 4,287,075, Cl. 106-39.500.
Goshima, Yoshio; and Osada, Hisashi, 4,287,492, Cl. 333-140.000.
Hashimoto, Tadashi; and Jindou, Katsuya, 4,287,494, Cl. 333-202.000.
Te Ka De Felten & Guilleaume Fernmeldeanlagen GmbH: *See*—
Meyers, Charles, 4,287,595, Cl. 375-28.000.
Technical Development Company: *See*—
Tauber, Thomas E.; and Magee, James, 4,286,464, Cl. 73-293.000.
Tefertiller, Nancy B.; Burdett, Kenneth A.; and Harris, Robert F., to Dow Chemical Co., The. Addition polymerizable polyethers having pendant ethylenically unsaturated urethane groups. 4,287,323, Cl. 525-404.000.
Teledyne Industries, Inc.: *See*—
Smith, Raymond, 4,286,430, Cl. 60-39.16R.
Teletype Corporation: *See*—
Rumps, Norbert A., 4,286,836, Cl. 339-97.00R.
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Coetzer, Johan; and Thackeray, Michael M., 4,287,269, Cl. 429-103.000.
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Budich, Wolfgang; and Theissen, Hans, 4,286,716, Cl. 206-577.000.
Theysohn, Rainer; Zeitler, Gerhard; Weiss, Frank; Willing, Hans; and Seiler, Erhard, to BASF Aktiengesellschaft. Preparation of finely divided polyolefin molding materials containing conductive carbon

black, and their use for the production of moldings. 4,287,117, Cl. 260-42.460.
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Thomas, Alfred W.; and op den Camp, Lutz E. A., to Lucas Industries Limited. Servo boosters for vehicle braking systems. 4,286,501, Cl. 91-376.00R.
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Thomas, Jacob E.; and Italiano, Victor J., to NCR Corporation. Valve for ink jet printer. 4,287,523, Cl. 346-140.00R.
Thomas, William R., to Baxter Travenol Laboratories, Inc. Method for treating blood clotting factor inhibitors. 4,287,180, Cl. 424-101.000.
Thompson, Buster R. High-speed smokeless coke oven battery. 4,287,024, Cl. 202-134.000.
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Galves, Jean-Pierre; and Gutierrez, Jean-Marie, 4,287,230, Cl. 427-65.000.
Huignard, Jean-Pierre; Leclerc, Pierre; Carballes, Jean-Claude; and Nappo, Armand, 4,286,838, Cl. 350-96.110.
Pircher, Georges, 4,286,878, Cl. 356-350.000.
Thornton, Alan; and Uttley, John S., to Bondina, Ltd. Multizonal fiber distribution. 4,287,246, Cl. 428-113.000.
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Modisette, Jerry L., 4,286,347, Cl. 9-8.00R.
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Kitik, Walter; Reder, Rodney; and Kurpiewski, Stanley, 4,287,400, Cl. 200-302.000.
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Tinney, Francis J.; Connor, David T.; Cetenko, Wiaczeslaw A.; Kerbleski, Joseph J.; and Sorenson, Roderick J., to Warner-Lambert Company. Dihydro-oxo-pyrido[1,2-a]thienopyrimidine compounds. 4,287,340, Cl. 544-250.000.
Tobias, Emil. Device for collection and disposal of pet waste. 4,286,816, Cl. 294-1.0BA.
Tocquet, Bernard, to Etat Francais represente par le Delegue General pour l'Armement. Piezo transducers with mechanical amplification for very low frequencies, and acoustic antennas. 4,287,582, Cl. 367-163.000.
Todokoro, Masatoshi. Tennis game board. 4,286,785, Cl. 273-85.00D.
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Tominaga, Akira; and Nishida, Reijiro, to Kansai Paint Co., Ltd. Process for electrodeposition of cationic resins. 4,287,041, Cl. 204-181.00C.
Tominaga, Tamotsu; Mihara, Teruyoshi; Oguro, Takeshi; and Takeuchi, Masami, to Nissan Motor Company, Limited. Pressure sensor. 4,287,501, Cl. 338-42.000.
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Tomlin, Jerry B.; and Hodgeman, Herbert H., to Daniel Industries, Inc. Four-way plug valve. 4,286,625, Cl. 137-625.430.
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Tonge, Donald R. Liquid mix dispensing gun. 4,286,734, Cl. 222-145.000.
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Torok, John, to Atomic Energy of Canada Ltd. Nuclear reactor decontamination. 4,287,002, Cl. 134-3.000.
Torok, Theodore E.; Shin, Paik W.; and Borzillo, Angelo R., to Bethlehem Steel Corporation. Method of improving the ductility of the coating of an aluminum-zinc alloy coated ferrous product. 4,287,008, Cl. 148-127.000.
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Yamamura, Toshio; and Muraki, Takeshi, 4,287,420, Cl. 250-402.000.
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Towsend, Marvin S. Disposable article with non-leachable saline water indicator. 4,287,153, Cl. 422-56.000.
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Toyoshima, Kumao; Hakura, Akira; Nakanishi, Toshihiro; and Yoshizumi, Hajime, to Suntory Ltd. Method for the detection of viruses. 4,287,185, Cl. 424-177.000.
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Inukai, Mitsuo; and Kamiyama, Hajime, 4,286,758, Cl. 242-107.000.
Matsunami, Muneharu; Kubota, Tatsushi; Yoshida, Akio; and Inokuchi, Nobuyuki, 4,286,805, Cl. 280-803.000.
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Trayner, Brian T., to British Aerospace Public Limited Company. Latch devices. 4,286,522, Cl. 102-255.000.
Treffers, Willem M. Building structure and coupling profile associated therewith. 4,286,419, Cl. 52-39.000.
Treiber, Fritz F.; and Margraf, Dallas A., to Hobart Corporation. Tank flushing delay arrangement for a steam generator. 4,287,407, Cl. 219-273.000.
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Trias, John A., to United States of America, Navy. Optical fiber test apparatus. 4,286,469, Cl. 73-829.000.
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Mower, Peter; and Gadd, John H., 4,286,351, Cl. 15-250.420.
Trimbach, Jurgen: *See—*
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Trimmer, William S. N.; and Laser, Mark R., to Johnson & Johnson. Force sensor. 4,286,459, Cl. 73-862.590.
Triumph Werke Nurnberg A.G.: *See—*
Ebert, Hermann; and Bachmann, Gunter, 4,286,889, Cl. 400-697.100.
Trojani, Benito L. Finned tube for heat exchangers. 4,286,655, Cl. 165-179.000.
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Tsutsumi, Saburo, to Nissan Motor Company, Limited. Variable compression ratio internal combustion engine. 4,286,552, Cl. 123-48.0AA.
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Tuggle, Lloyd H., to Beaird-Poulan Division of Emerson Electric Co. Narrow profile power handle for line trimmer and the like. 4,286,675, Cl. 173-163.000.
Turney, Larry R., to Victor Equipment Company. Combination torch and check valve assembly. 4,286,620, Cl. 137-454.200.
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Uber, Raymond F.; Childers, Clifford W.; and Naylor, Floyd E., to Phillips Petroleum Co. Block copolymers of conjugated dienes and lactones as modifiers of unsaturated polyesters. 4,287,313, Cl. 525-91.000.
Uchida, Yukimasa, to Tokyo Shibaura Denki Kabushiki Kaisha. Memory cell with non-volatile memory elements. 4,287,574, Cl. 365-156.000.
Uchidoi, Masanori; Shimizu, Masami; Date, Nobuaki; and Aizawa, Hiroshi, to Canon Kabushiki Kaisha. Digital camera. 4,286,849, Cl. 354-23.00D.
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Ueda, Minoru, to Yoshida Kogyo, K.K. Slider applicator for slide fasteners. 4,286,382, Cl. 29-768.000.
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UMC Industries, Inc.: *See—*
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Unico, Inc.: *See—*
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Potts, James E., 4,286,586, Cl. 128-90.000.
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Couch, Lana M., 4,286,460, Cl. 73-147.000.
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Sides, Nathan T.; and Daugherty, Thomas L., 4,286,828, Cl. 308-26.000.
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Cense, Adriaan, 4,287,476, Cl. 330-254.000.
Clasen, Rolf; and Lydtin, Hans J., 4,286,981, Cl. 65-169.000.
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Lersmacher, Bernhard, 4,287,025, Cl. 202-222.000.
Reuvekamp, Antonius H. J., 4,287,393, Cl. 179-70.000.
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Golden, Gerald S.; Lemkey, Franklin D.; and Brooks, Clyde S., 4,287,096, Cl. 252-455.00R.
Goller, Glen J.; and Salonia, Joseph R., 4,287,232, Cl. 427-113.000.
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Lumsden, James R., 4,287,567, Cl. 364-900.000.

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Kanamaru, Hitoshi, 4,287,413, Cl. 369-45.000.
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Upjohn Company, The: *See—*
Johnson, Garland A.; and Peuler, Jacob D., 4,287,368, Cl. 568-436.000.
McCall, John M., 4,287,338, Cl. 544-123.000.
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Sih, John C., 4,287,361, Cl. 562-503.000.
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Usami, Susumu; Hayashi, Yoshihiro; Nakaho, Junichi; and Yasumatsu, Jun, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Tokai Rika Denki Seisakusho. Webbing lock mechanism. 4,286,759, Cl. 242-107.200.
Ushijima, Fumihiro: *See—*
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Suh, John T.; Williams, Bruce E.; Skiles, Jerry W.; and Loev, Bernard, 4,287,203, Cl. 424-275.000.
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Vakil, Bharat N., to Zenith Radio Corporation. High voltage shutdown circuit with current feedback for cathode ray tube. 4,287,535, Cl. 358-243.000.
Valdiserri, Leo L., to Borg-Warner Corporation. Phosphite-isocyanurates. 4,287,339, Cl. 544-214.000.
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Van Tongeren U.K. Limited: *See—*
Roots, Philip S., 4,287,158, Cl. 422-241.000.
Vanassche, Willy J.; Pattyn, Herman A.; Moisar, Erik; and Klotzer, Sieghart, to Agfa-Gevaert, N.V. Direct-positive emulsion containing fogged, silver halide grains of silver iodide content. 4,287,296, Cl. 430-411.000.
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Vanhumbeeck, Jacky; De Steur, Hubert; Heyneman, Guido; and Vandenbossche, Chris, 4,286,965, Cl. 23-230.00A.
van der Lely, Cornelis. Agricultural machine. 4,286,427, Cl. 56-377.000.
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Vander Voort, George F., to Bethlehem Steel Corporation. Steel composition chipper knife. 4,287,007, Cl. 148-36.000.
van Gasse, Rene L. E., to Stamicarbon, B.V. Thermosetting powder based on an unsaturated polyester resin. 4,287,310, Cl. 525-44.000.
Van Gilse, Jaap; and Paerels, Gerard B., to Duphar International Research B.V. Algicidal composition and method of preventing or controlling algae with said composition. 4,286,983, Cl. 71-67.000.
Van Hooydonk, Anton H. G.: *See—*
Forsyth, Clark H.; Van Hooydonk, Anton H. G.; and Ralph, Harold D., 4,286,672, Cl. 172-311.000.
Vanhumbeeck, Jacky; De Steur, Hubert; Heyneman, Guido; and Vandenbossche, Chris, to Siemens Aktiengesellschaft. Control apparatus for automatically maintaining bath component concentration in an electroless copper plating bath. 4,286,965, Cl. 23-230.00A.
Van Linden, Jan H. L.; and Gorss, Jeffrey B., to Aluminum Company of America. Vortex melting system. 4,286,985, Cl. 75-65.00R.
Van Loveren, Augustinus G.: *See—*
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Van Namen, Frederik T.: *See—*
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van Rooijen-Nieuwenhijs, Bertha-Maria: *See—*
van Rooijen, Rudolf J. A. M., 4,286,673, Cl. 172-378.000.
van Rooijen, Rudolf J. A. M., to van Rooijen-Nieuwenhijs, Bertha-Maria. Basket-shaped dual function hoe-rake. 4,286,673, Cl. 172-378.000.
Van Scott, Eugene J.; and Yu, Ruey J. Dithranol compositions stabilized with alpha hydroxyacids. 4,287,214, Cl. 424-346.000.
Van Tuyl, Richard. System for preheating fuel. 4,286,564, Cl. 123-545.000.
Van Vliet, Robert M.; and Bushelle, William R., to United States of America, Air Force. Slot chevron element for periodic antennas and radomes. 4,287,520, Cl. 343-909.000.
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Vaupel, Knut: *See—*
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Vereinigte Baubeschlagfabriken Gretsch & Co. GmbH: *See—*
Richert, Manfred, 4,286,801, Cl. 280-629.000.
Vermeire, William R. Optical illusion-producing rotating device. 4,286,780, Cl. 272-8.00D.
Vesel, John E.: *See—*
Stelben, John J.; Siladi, Kim E.; Herman, George A., Jr.; and Vesel, John E., 4,286,866, Cl. 355-14.00D.
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Vickers Limited: *See—*
Moore, Derek S., 4,287,532, Cl. 358-107.000.
Smith, Francis H.; and Gale, Richard W., 4,286,874, Cl. 356-338.000.
Smith, Francis H., 4,286,875, Cl. 356-338.000.
Victor Equipment Company: *See—*
Turney, Larry R., 4,286,620, Cl. 137-454.200.
Viland, Michael G., to Pako Corporation. Automatic load-adjusting vent control for film dryers. 4,286,392, Cl. 34-47.000.
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Sprecker, Mark A.; Trenkle, Robert W.; Mookherjee, Braja D.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; and Schmitt, Frederick L., 4,287,133, Cl. 260-458.00R.
Vinyard, Roy E., to Phillips Petroleum Company. Method for the construction of a baffled heat exchanger. 4,286,366, Cl. 29-157.400.
Vitins, Michael, to BBC Brown, Boveri & Co. Ltd. Method and apparatus for fault and/or fault direction detection. 4,287,547, Cl. 361-82.000.
Vits, Hilmar, to Vits Maschinenbau GmbH. Continuous uncoiler for coils of web lengths. 4,286,756, Cl. 242-58.100.
Vits Maschinenbau GmbH: *See—*
Vits, Hilmar, 4,286,756, Cl. 242-58.100.
Vivitar Corporation: *See—*
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Voges, Dieter: *See—*
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Brunner, Erwin; Schubert, Eckart; Lindner, Alfred; Merger, Franz; Volkamer, Klaus; Strohmeyer, Max; and Sandrock, Gerhard, 4,287,379, Cl. 585-839.000.
von Holdt, John W. Collapsible mold core. 4,286,766, Cl. 249-144.000.
von Nordenskjold, Reinhart. Apparatus for biological purification of sewage. 4,287,062, Cl. 210-199.000.
von Zander, Hans, to Johann Schaefer Kalkwerke. Process and shaft kiln for the burning of lime or similar bulk materials. 4,287,160, Cl. 423-168.000.
Vorwerk & Co. Interholding GmbH: *See—*
Uibel, Paul-Ulrich; and Dorr, Manfred, 4,286,885, Cl. 366-347.000.

Vosper, Ralph R.; Spoormaker, Arie W.; Binasik, Chester S.; and Harthun, Norman E., to Coen Company, Inc. Wall fired duct heater. 4,286,945, Cl. 432-29.000.

Vought Corporation: *See—*
Musgrove, Robert G., 4,286,761, Cl. 244-75.00R.

Voy Manufacturing Co.: *See—*
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Vrolyk, John J.; and Pauckert, Ronald P., to Rockwell International Corporation. Trickle-type thermal storage unit. 4,286,574, Cl. 126-400.000.

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Howe, Milton A., Jr., 4,286,422, Cl. 53-473.000.

W. R. Weaver Company: *See—*
Ross, Cecil J.; and Thompson, John F., 4,286,388, Cl. 33-246.000.

Wada, Yasuhiro, to Copal Company Limited. Driving circuit for printing device in electronic cash register. 4,287,550, Cl. 361-167.000.

Wagner, Fritz; Rapp, Peter; Bock, Hans; Lindorfer, Walter; Schulz, Walther; and Gebetsberger, Wilhelm, to Gesellschaft fur Biotechnologische Forschung GmbH; and Wintershall Aktiengesellschaft. Process and installation for the flooding of petroleum deposits and oil shale. 4,286,660, Cl. 166-246.000.

Wagner, Josef; and Huber, Willi, to J. Wagner AG. Electrostatic spray pistol. 4,287,552, Cl. 361-228.000.

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Wales, James R.: *See—*
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Walker, Jack M.: *See—*
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Walker, Loren H.; and Cutler, John H., to General Electric Company. Zero rotation and zero torque detector and method for an AC electric motor drive. 4,287,463, Cl. 318-803.000.

Walker, Raymond W., to Deep Oil Technology, Inc. Apparatus and method for conducting offshore well operations. 4,286,665, Cl. 166-339.000.

Walker, William R.: *See—*
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Wallace, Sr., Terry C.: *See—*
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Wallace, William A. Desalinization method. 4,287,026, Cl. 203-10.000.

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Walter Kidde and Company, Inc.: *See—*
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Walter, Manfred: *See—*
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Wang, Shing C.; and Hamerdinger, Randolph W., to Xerox Corporation. Segmented hollow cathode laser device. 4,287,484, Cl. 331-94.50G.

Ward, Ian M.: *See—*
Capaccio, Giancarlo; and Ward, Ian M., 4,287,149, Cl. 264-210.700.

Warner Electric Brake & Clutch Company: *See—*
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Wartman, Carl E.; and Dussich, George. Mailbox announcer. 4,287,514, Cl. 340-569.000.

Wat, Edward K. W., to Du Pont de Nemours, E. I., and Company. Preparation of N-cyanoimidate herbicide intermediates. 4,287,343, Cl. 544-320.000.

Watanabe, Eiki, to Mitsubishi Denki Kabushiki Kaisha. Elevator traction machine. 4,287,551, Cl. 361-212.000.

Watanabe, Hiroshi: *See—*
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Watanabe, Katsumi, to Yugen Kaisha Watanabe Kenkyusho. Simplified record player. 4,286,789, Cl. 369-244.000.

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Watanabe, Minoru; Oikawa, Mitsuhiro; Nishimura, Toshio; Asada, Masao; Tezuka, Masao; and Cho, Tsurahide, to Tokyo Shibaura Denki Kabushikikaisha. Method for surface treatment of phosphor particles. 4,287,229, Cl. 427-64.000.

Watanabe, Shotaro; Tomono, Makoto; Yamakawa, Goichi; Nishimura, Takeo; and Takahashi, Nobuo, to Konishiroku Photo Industry Co., Ltd. Iron powder developing carrier and the manufacturing method of the same, developer containing said carrier and method of forming visible image by using said developer. 4,287,283, Cl. 430-108.000.

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Waters Associates, Inc.: *See—*
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Watson, Joe L. Combination business card and key storage device. 4,286,641, Cl. 150-40.000.

Wattelle, Michel: *See—*
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Watts, Lewis W., Jr.: *See—*
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Watts, Loyal O.: *See—*
Burrows, J. W.; and Watts, Loyal O., 4,286,432, Cl. 60-404.000.

Waukee Engineering Company Inc.: *See—*
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Webb, Paul C.: *See—*
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Galer, Richard E.; and Webb, Paul C., 4,286,992, Cl. 106-90.000.

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Webster, Harold F., to General Electric Company. Method for writing on archival target and target produced thereby. 4,287,572, Cl. 365-128.000.

Wedman, Thomas W., to Green Line, Inc. Mounting assembly for an agricultural implement. 4,286,892, Cl. 403-262.000.

Weibel, James A., Sr.; and Vassallo, Franklin A., to Calspan Corporation. Electrochemical method for removing metallic sheaths. 4,287,033, Cl. 204-146.000.

Weigh Right Electronic Systems, Inc.: *See—*
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Weikert, Roy J. Apparatus for controlling flow of fluent material. 4,286,733, Cl. 222-105.000.

Weil, Roger: *See—*
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Weinhaus, Robert S. Meat grain template. 4,286,354, Cl. 17-1.00R.

Weiss, Frank: *See—*
Theysohn, Rainer; Zeitler, Gerhard; Weiss, Frank; Willing, Hans; and Seiler, Erhard, 4,287,117, Cl. 260-42.460.

Weissman, Sigmund: *See—*
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Weitz, Hans-Martin; and Fischer, Rolf, to BASF Aktiengesellschaft. Preparation of vinylglycol esters. 4,287,356, Cl. 560-244.000.

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Jager, Gerd; Bernuth, Wolfgang; Irrgang, Klaus; Wendt, Hans-Joachim; and Honecker, Siegfried, 4,286,879, Cl. 356-358.000.

Wenstrom, Richard T., to Sea Savory, Inc. Machine for removing meat from prepared crab bodies. 4,286,356, Cl. 17-46.000.

Wentorf, Robert H., Jr.; and Rocco, William A., to General Electric Company. Apparatus and method for isolation of diamond seeds for growing diamonds. 4,287,168, Cl. 423-446.000.

Weppelman, Roger M.: *See—*
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Werner, Hans: *See—*
Marsch, Walter; and Werner, Hans, 4,286,482, Cl. 81-55.000.

Wert, John C., III. CW-Pulsed laser. 4,287,482, Cl. 331-94.50F.

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Wessel, Wolf: *See—*
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West, George C.; and Polfus, William F., to Reeves Brothers, Inc. Fabric coating process and product thereof. 4,287,261, Cl. 428-421.000.

Westenhofer, Donald G.; and Meckler, Gershon, to Gershon Meckler Associates, P.C. Flow control and fire detection apparatus. 4,286,667, Cl. 169-16.000.
Western Electric Co., Inc.: *See—*
Gursky, Michael T.; and Pcihoda, William W., 4,286,860, Cl. 354-319.000.
Rohrbach, William R., 4,287,401, Cl. 200-308.000.
Westinghouse Electric Corp.: *See—*
Cooper, Frank W., Jr., 4,286,416, Cl. 51-334.000.
DeCaro, Aristide R.; Murphy, Eugene F.; and Maynard, Billy A., 4,287,231, Cl. 427-106.000.
Donlan, John P.; and Krauss, Alfred R., 4,286,921, Cl. 415-136.000.
Peterson, Robert S., 4,286,447, Cl. 72-9.000.
Westvaco Corporation: *See—*
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Clarke, Clarence C., 4,286,438, Cl. 62-216.000.
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White, Thomas P., Sr. Shoe last conversion assembly for lasting boots. 4,286,348, Cl. 12-133.00R.
Whitehouse, Michael W.: *See—*
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Whiteley, Isaac C. Chimney heat exchanger. 4,286,975, Cl. 55-269.000.
Whittle, Lee M.: *See—*
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Whittlesey, Curtis C.; and Mashikian, Matthew S., to Energy Development Associates, Inc. Zinc-chlorine battery plant system and method. 4,287,267, Cl. 429-49.000.
Wiechert, Edelbert, to Siemens Aktiengesellschaft. Switch device for a rail-bound transport car formed of a traveling carriage and a transport container that can be placed and locked onto the traveling carriage. 4,287,399, Cl. 200-153.00T.
Wiek, Eduard. Boat slipway for mobile or fixed set-up. 4,286,346, Cl. 9-1.200.
Wiggins, Douglas G., to Xerox Corporation. Gain control for scanning arrays. 4,287,536, Cl. 358-282.000.
Wikk Industries, Inc.: *See—*
Wikkerink, Lee; and Schinschke, James R., 4,286,411, Cl. 49-252.000.
Wikkerink, Lee; and Schinschke, James R., to Wikk Industries, Inc. Manual balanced door with door closer arm. 4,286,411, Cl. 49-252.000.
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Willard, Stephen. Exhaust filter system. 4,286,528, Cl. 110-203.000.
Williams, Bruce E.: *See—*
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Williams, Robert H. Rotary internal combustion engine. 4,286,555, Cl. 123-228.000.
Willing, Hans: *See—*
Theysohn, Rainer; Zeitler, Gerhard; Weiss, Frank; Willing, Hans; and Seiler, Erhard, 4,287,117, Cl. 260-42.460.
Willmore, Kathryn A. Over-the-bed-table. 4,286,525, Cl. 108-93.000.
Wilson, Earl L.: *See—*
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Wilson, Herbert L.: *See—*
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Wilson, John C.: *See—*
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Wilson, Melvin. Combination electrically heated material receptacle and instrument heater. 4,287,408, Cl. 219-475.000.
Wilson, Paul A.: *See—*
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Wilson, Reginald D. Tea bag compressor. 4,286,514, Cl. 100-211.000.
Wilson, Robert E.: *See—*
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Wilson, Strathearn, to Connaught Laboratories Limited. Apparatus for dispensing liquids into tubes. 4,286,637, Cl. 141-374.000.
Wing, Phillip L., to Dow Chemical Company, The. Glycol compositions containing an ether modified silicone to inhibit gelling. 4,287,077, Cl. 252-75.000.
Winn, Kenneth R.: *See—*
Clark, John H.; Campillo, Anthony J.; Shapiro, Stanley L.; and Winn, Kenneth R., 4,287,035, Cl. 204-157.10R.
Winter, Joseph: *See—*
Gullotti, Damian V.; Damon, Lloyd E.; Chatfield, Phillip A.; and Winter, Joseph, 4,286,744, Cl. 228-125.000.
Winter, William E.: *See—*
Gladrow, Elroy M.; and Winter, William E., 4,287,048, Cl. 208-120.000.
Wintershall Aktiengesellschaft: *See—*
Wagner, Fritz; Rapp, Peter; Bock, Hans; Lindorfer, Walter; Schulz, Walther; and Gebetsberger, Wilhelm, 4,286,660, Cl. 166-246.000.
Wirth, Hans, to Black Clawson Company, The. Method and apparatus for controlling the braking system for an unwinder. 4,286,757, Cl. 242-75.440.
Wirthwein, Rolf: *See—*
Stober, Reinhard; Wirthwein, Rolf; and Hase, Christian, 4,287,135, Cl. 260-502.00R.
Wirtz, Edward A.: *See—*
Bianchetta, Donald L.; and Wirtz, Edward A., 4,286,502, Cl. 91-445.000.
Wiseman, Roy R., Jr.; and Kovac, James J., to Goodyear Aerospace Corporation. Grooved carbon brake discs. 4,286,694, Cl. 188-71.500.
Wisner, Elizabeth M. Sample container with collapsible funnel. 4,286,634, Cl. 141-95.000.
Witte, John C., to Xerox Corporation. Cross-mixing system. 4,286,544, Cl. 118-657.000.
Wolff, Friedrich. Radiation apparatus. 4,287,554, Cl. 362-218.000.
Wollweber, Hartmund; Kolling, Heinrich; Thomas, Herbert; and Andrews, Peter, to Bayer Aktiengesellschaft. Benzimidazolylcarbamic acid esters substituted on the benzenoid nucleus by an oxy or thio substituent. 4,287,199, Cl. 424-267.000.
Wong, Backman; and Wilson, Earl L., to Standard-Thomson Corporation. Thermostatic valve device having non-linear flow characteristics. 4,286,750, Cl. 236-34.500.
Wong, K. Lim; and Schmidt, Gustav A., to Avery International Corporation. Reinforced adhesive tapes. 4,287,255, Cl. 428-343.000.
Wong, Patrick S., to ALZA Corporation. Vaginal drug delivery system made from polymer. 4,286,587, Cl. 128-127.000.
Wons, Heinz: *See—*
Kuphal, Wilko; and Wons, Heinz, 4,287,422, Cl. 250-439.00R.
Woo, David V.: *See—*
Rupp, Arthur F.; and Woo, David V., 4,287,165, Cl. 423-323.000.
Wood, Dennis, to Coin Controls Limited. Coin-validating arrangement. 4,286,704, Cl. 194-100.00A.
Wood, William M.: *See—*
Clausen, Eivind; Amos, Benton H.; and Wood, William M., 4,286,624, Cl. 137-625.190.
Woodman, Brian E.: *See—*
Melitz, Daniel T.; Searle, Kenneth L.; and Woodman, Brian E., 4,286,896, Cl. 405-185.000.
Woodring, William J.; and Gulino, James A., to GAF Corporation. Heat bondable asphaltic sound deadener. 4,287,263, Cl. 428-489.000.
Woodson, Wayne D.: *See—*
Stewart, Patrick H.; and Woodson, Wayne D., 4,287,092, Cl. 252-429.00R.
Worm, Allan T., to Minnesota Mining and Manufacturing Company. Epichlorohydrin elastomer compositions. 4,287,322, Cl. 525-403.000.
Wrist-A-Matic, Ltd.: *See—*
Seckendorf, Bernard A., 4,286,854, Cl. 354-129.000.
Wunderlich, Klaus: *See—*
Ehrig, Volker; Groll, Manfred; and Wunderlich, Klaus, 4,286,962, Cl. 8-549.000.
Wylie, William H., to Metalfab Industries, Inc. Security locking assembly. 4,286,813, Cl. 292-251.000.
Wyman-Gordon Company: *See—*
Jain, Sulekh C.; and Morris, Charles A., 4,287,073, Cl. 252-30.000.
Wynne, John M.: *See—*
Raber, Samuel; Wynne, John M.; and Heim, Alan M., 4,287,515, Cl. 340-584.000.
Xerox Corporation: *See—*
Bayley, Robert D., 4,287,281, Cl. 430-107.000.
Bolte, Steven B.; and Lewis, Richard B., 4,287,287, Cl. 430-137.000.
Brown, George A.; Relyea, Lloyd A.; Scharfe, Merlin E.; and Pinsler, Heinz W., 4,287,279, Cl. 430-58.000.
Castelli, Vittorio; and Hamaker, Ralph A., 4,286,706, Cl. 198-806.000.
Lu, Chin H.; and Erhardt, Peter F., 4,287,284, Cl. 430-120.000.
Silverberg, Morton, 4,286,870, Cl. 355-76.000.
Swift, Joseph A., 4,287,280, Cl. 430-99.000.
Wang, Shing C.; and Hamerdinger, Randolph W., 4,287,484, Cl. 331-94.50G.
Wiggins, Douglas G., 4,287,536, Cl. 358-282.000.
Witte, John C., 4,286,544, Cl. 118-657.000.
Yabuuchi, Takahiro: *See—*
Fujmura, Hajime; Hiramatsu, Yasuzo; Yabuuchi, Takahiro; Hisaki, Masakatu; Takikawa, Katsuo; Honna, Takaji; Miyake, Hidekazu; and Kajitani, Makoto, 4,287,207, Cl. 424-282.000.
Yamaguchi, Akihiro; Yamaguchi, Keizaburo; Murakami, Hisamichi; and Kobayashi, Tadashi, to Mitsui Toatsu Chemicals, Inc. Process for preparing bisphenol sulfone derivatives. 4,287,366, Cl. 568-33.000.
Yamaguchi, Keizaburo: *See—*
Yamaguchi, Akihiro; Yamaguchi, Keizaburo; Murakami, Hisamichi; and Kobayashi, Tadashi, 4,287,366, Cl. 568-33.000.
Yamaguchi, Yuzo, to Hitachi, Ltd. Apparatus for pumping operation of a hydraulic machine having Francis type runner. 4,286,919, Cl. 415-112.000.
Yamakawa, Goichi: *See—*
Watanabe, Shotaro; Tomono, Makoto; Yamakawa, Goichi; Nishimura, Takeo; and Takahashi, Nobuo, 4,287,283, Cl. 430-108.000.
Yamamoto, Takeshi: *See—*
Tanahashi, Makoto; Yamauchi, Hisashi; and Yamamoto, Takeshi, 4,287,541, Cl. 360-92.000.

Yamamura, Toshio; and Muraki, Takeshi, to Toshiba Corporation. Stereoscopic X-ray device. 4,287,420, Cl. 250-402.000.

Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Nakashima, Toshihide; Nakaji, Osamu; Takakura, Koichi; and Suzuki, Takayoshi, 4,287,177, Cl. 424-81.000.

Yamauchi, Hisashi: *See*—
Tanahashi, Makoto; Yamauchi, Hisashi; and Yamamoto, Takeshi, 4,287,541, Cl. 360-92.000.

Yamazaki, Seiichi: *See*—
Kogane, Mikio; and Yamazaki, Seiichi, 4,286,869, Cl. 355-75.000.

Yanagida, Toshio, to Nissan Motor Company, Limited. Air ventilation apparatus for vehicle. 4,286,506, Cl. 98-2.000.

Yasui, Toshio; and Naito, Motoharu, to Nippondenso Co., Ltd. Electric control circuit for safety apparatus in automotive vehicles. 4,287,431, Cl. 307-10.00R.

Yasumatsu, Jun: *See*—
Usami, Susumu; Hayashi, Yoshihiro; Nakaho, Junichi; and Yasumatsu, Jun, 4,286,759, Cl. 242-107.200.

Yasutake, Kenichi; and Watanabe, Tetsuji, to K.K. Elco International. Electrical connector, an insulator therefor and a fitting jig for an assembly of these. 4,286,837, Cl. 339-176.0MP.

Yee, Edward M.: *See*—
Gutierrez, William A.; Wilson, Herbert L.; and Yee, Edward M., 4,286,373, Cl. 29-572.000.

Yeh, Yu S.: *See*—
Langseth, Rollin E.; and Yeh, Yu S., 4,287,598, Cl. 455-52.000.

Yoder Company, The: *See*—
Chang, William J. H., 4,286,451, Cl. 72-161.000.

Yokota, Shigeru: *See*—
Inoue, Haruo; Yokota, Shigeru; and Saito, Yoshiharu, 4,286,819, Cl. 296-65.00R.

Yokoyama, Akira; and Arano, Yasushi, to Nihon Medi-Physics Co., Ltd. 2-Oxopropionaldehyde bis(thiosemicarbazone) derivatives. 4,287,362, Cl. 562-556.000.

Yoshida, Akio: *See*—
Matsunami, Muneharu; Kubota, Tatsushi; Yoshida, Akio; and Inokuchi, Nobuyuki, 4,286,805, Cl. 280-803.000.

Yoshida Kogyo, K.K.: *See*—
Ueda, Minoru, 4,286,382, Cl. 29-768.000.

Yoshida, Syusaku: *See*—
Ohta, Tatsuo; Shinozaki, Sohji; Yoshida, Syusaku; and Ohba, Hideo, 4,287,278, Cl. 430-53.000.

Yoshida, Yasuyuki: *See*—
Ohmae, Takashi; Fukaya, Yasuhiro; Yoshida, Yasuyuki; Oka, Tamotu; Sato, Masahiko; and Nagareda, Masazumi, 4,287,405, Cl. 219-136.000.

Yoshizumi, Hajime: *See*—
Toyoshima, Kumao; Hakura, Akira; Nakanishi, Toshihiro; and Yoshizumi, Hajime, 4,287,185, Cl. 424-177.000.

Young, Allen E., to Bendix Corporation, The. Scanning light beam lumber defect position system and method of using same. 4,286,880, Cl. 356-431.000.

Young, David M., to Massachusetts General Hospital, The. Process for healing wounds. 4,287,184, Cl. 424-177.000.

Young, William C., to RCA Corporation. Assembly for positioning the coupling probe of a waveguide. 4,287,496, Cl. 333-248.000.

Yu, Ruey J.: *See*—
Van Scott, Eugene J.; and Yu, Ruey J., 4,287,214, Cl. 424-346.000.

Yuasa Battery Co. Ltd.: *See*—
Machi, Sueo; Ishigaki, Isao; Sugo, Takanobu; Okada, Toshio; Murata, Kazuo; Tanso, Shiro; and Senoo, Keizi, 4,287,272, Cl. 429-144.000.

Yugen Kaisha Watanabe Kenkyusho: *See*—
Watanabe, Katsumi, 4,286,789, Cl. 369-244.000.

Yurecko, John M., Jr.: *See*—
Kulka, Kurt; Zazula, Teodosij; and Yurecko, John M., Jr., 4,287,100, Cl. 252-522.00R.

Yusa, Haruhiko; Oota, Masanori; and Suzuki, Katumi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for producing a graft-copolymer and blends therewith. 4,287,312, Cl. 525-83.000.

Yuyama, Masahiro: *See*—
Kitagawa, Yoshihiko; Hanamura, Yoshimi; Yuyama, Masahiro; Moritani, Masahiko; Sakuramoto, Akira; and Suzuki, Mikio, 4,287,317, Cl. 525-309.000.

Zahir, Abdul-Cader: *See*—
Forgo, Imre; Zahir, Abdul-Cader; and Francois, Jacques, 4,287,106, Cl. 260-28.50B.

Zahner, Hans; Holst, Hartwig; Zoebelein, Gerhard; and Keckeisen, Adelinde, to Bayer Aktiengesellschaft. Antibiotics, a process for their preparation and their use as plant protection agents. 4,287,186, Cl. 424-181.000.

Zahnradfabrik Friedrichshafen Aktiengesellschaft: *See*—
Meyerle, Michael; Anton, Otto; and Ehrlinger, Friedrich, 4,286,477, Cl. 74-687.000.

Zani, Marina: *See*—
Cazzaro, Giorgio; Matera, Giancarlo; Cavallaro, Antonino; and Zani, Marina, 4,287,148, Cl. 264-182.000.

Zazula, Teodosij: *See*—
Kulka, Kurt; Zazula, Teodosij; and Yurecko, John M., Jr., 4,287,100, Cl. 252-522.00R.

Zdarsky, Robert C.; and Lyons, Russell, to Champion International Corporation. Sleeve with pre-applied handle for setup box or folding carton. 4,286,714, Cl. 206-526.000.

Zeigner, Willard L.; and Blaney, Peter G., to Zemco, Inc. Stop/start control system for engine. 4,286,683, Cl. 180-54.00R.

Zeitler, Gerhard: *See*—
Theysohn, Rainer; Zeitler, Gerhard; Weiss, Frank; Willing, Hans; and Seiler, Erhard, 4,287,117, Cl. 260-42.460.

Zemco, Inc.: *See*—
Zeigner, Willard L.; and Blaney, Peter G., 4,286,683, Cl. 180-54.00R.

Zenith Radio Corporation: *See*—
Vakil, Bharat N., 4,287,535, Cl. 358-243.000.

Zewen, Cabinet A.: *See*—
Busse, Claus-Adolf; and Labrande, Jean-Paul, 4,286,652, Cl. 165-96.000.

Ziegel, Douglas H., to RCA Corporation. Work holder. 4,286,414, Cl. 51-229.000.

Ziv, Avraham; Tanaka, Akira; Hollowell, William; Sieber, William J.; and Ahad, Munir J., to American Safety Equipment Corporation. Inertia switches. 4,287,398, Cl. 200-61.45R.

Zizzo, Anthony F.: *See*—
Swift, Billy K.; Zizzo, Anthony F.; and Blevins, Willard A., 4,287,480, Cl. 331-1.00A.

Zoebelein, Gerhard: *See*—
Zahner, Hans; Holst, Hartwig; Zoebelein, Gerhard; and Keckeisen, Adelinde, 4,287,186, Cl. 424-181.000.

Zoellner, Roger O.: *See*—
Searcy, James A.; Zoellner, Roger O.; and Hoffmann, Ronald C., 4,286,572, Cl. 126-299.00D.

Zubkov, Valery N.: *See*—
Belsky, Arkady A.; Eljutin, Alexandr V.; Zubkov, Valery N.; Konjukov, Alexandr I.; Krasinskaya, Lidia I.; Nekrasova, Elena A.; Nizharadze, Konstantin S.; Markova, Larisa F.; Mirskaya, Mirra G.; Frolov, Alexei V.; and Judin, Evgeny A., 4,287,030, Cl. 204-105.00R.

Zucker, Jerry, to Raybestos-Manhattan, Inc. Method of improving properties of ceramic fibers. 4,286,999, Cl. 106-308.00Q.

Zuehlke, Rainer: *See*—
Brosch, Rudolf; Schettler, Helmut; Schumacher, Hans; and Zuehlke, Rainer, 4,287,437, Cl. 307-296.00R.

Zultzke, Walter: *See*—
Heimbach, Klaus-Jurgen; and Zultzke, Walter, 4,287,224, Cl. 427-42.000.

Zverkov, Garik E.: *See*—
Godin, Eduard M.; Anoshko, Vladimir A.; Gavrilov, Anatoly N.; Akhmerov, Almas F.; Zverkov, Garik E.; Semenov, Valentin P.; Grachev, Vladimir V.; Chepurin, Valentin M.; Mikhailov, Viktor Y.; and Rybnikov, Sergei I., 4,286,450, Cl. 72-59.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF SEPTEMBER, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bianchi, Ralph A.: *See—*
Farrell, James H.; Bianchi, Ralph A.; and Johanson, Edward E., Re. 30,729, Cl. 210-801.000.

Canon Kabushiki Kaisha: *See—*
Yokota, Hideo, Re. 30,728, Cl. 350-464.000.

Chong, Robert S. Y. Cable dispenser. Re. 30,727, Cl. 242-85.000.

Duff, Ian D., to National Research Development Corporation. Apparatus for use in investigating specimens. Re. 30,730, Cl. 422-64.000.

Farrell, James H.; Bianchi, Ralph A.; and Johanson, Edward E., to JBF Scientific Corporation. Floatage collecting apparatus and method. Re. 30,729, Cl. 210-801.000.

Gergis, Isoris S. Consecutive bit access of magnetic bubble domain memory devices. Re. 30,732, Cl. 365-15.000.

Hudson, Derek; Sharpe, Robert; and Szelke, Michael. Enkephalin analogues. Re. 30,731, Cl. 424-177.000.

JBF Scientific Corporation: *See—*
Farrell, James H.; Bianchi, Ralph A.; and Johanson, Edward E., Re. 30,729, Cl. 210-801.000.

Johanson, Edward E.: *See—*
Farrell, James H.; Bianchi, Ralph A.; and Johanson, Edward E., Re. 30,729, Cl. 210-801.000.

Meeker, John G. Fireplace grate. Re. 30,725, Cl. 126-164.000.

National Research Development Corporation: *See—*
Duff, Ian D., Re. 30,730, Cl. 422-64.000.

Otten, Norman J.; and Presnell, Eldrige H., to Tower Products, Inc. Polymer film having linear tear properties. Re. 30,726, Cl. 206-601.000.

Presnell, Eldrige H.: *See—*
Otten, Norman J.; and Presnell, Eldrige H., Re. 30,726, Cl. 206-601.000.

Sharpe, Robert: *See—*
Hudson, Derek; Sharpe, Robert; and Szelke, Michael, Re. 30,731, Cl. 424-177.000.

Szelke, Michael: *See—*
Hudson, Derek; Sharpe, Robert; and Szelke, Michael, Re. 30,731, Cl. 424-177.000.

Tower Products, Inc.: *See—*
Otten, Norman J.; and Presnell, Eldrige H., Re. 30,726, Cl. 206-601.000.

Yokota, Hideo, to Canon Kabushiki Kaisha. High speed focusing telephoto lens. Re. 30,728, Cl. 350-464.000.

LIST OF DESIGN PATENTEES

Agee, Peter T. Bottle. 260,482, 9-1-81, Cl. D9-352.000.

Alex, James G., to J.G.A. Enterprises, Inc. Game board. 260,538, 9-1-81, Cl. D21-35.000.

Alexander, David, to Alexander, Jack E. Table. 260,464, 9-1-81, Cl. D6-147.000.

Alexander, Jack E.: *See—*
Alexander, David, 260,464, Cl. D6-147.000.

Allen, Anne W.: *See—*
Blake, Joseph W.; and Allen, Anne W., 260,469, Cl. D7-2.000.

AMBA Marketing Systems, Inc.: *See—*
Siegel, Milton I., 260,458, Cl. D3-48.000.

Ament, Donald S.; and Ament, Duane S., to Miracle Recreation Equipment Company. Playground slide. 260,543, 9-1-81, Cl. D21-244.000.

Ament, Donald S.; and Ament, Duane S., to Miracle Recreation Equipment Company. Playground swing. 260,544, 9-1-81, Cl. D21-246.000.

Ament, Donald S.; and Ament, Duane S., to Miracle Recreation Equipment Company. Rider seat for playground apparatus. 260,545, 9-1-81, Cl. D21-247.000.

Ament, Donald S.; and Ament, Duane S., to Miracle Recreation Equipment Company. Rider seat for playground apparatus. 260,546, 9-1-81, Cl. D21-247.000.

Ament, Donald S.; and Ament, Duane S., to Miracle Recreation Equipment Company. Rider seat for playground apparatus. 260,547, 9-1-81, Cl. D21-247.000.

Ament, Duane S.: *See—*
Ament, Donald S.; and Ament, Duane S., 260,543, Cl. D21-244.000.
Ament, Donald S.; and Ament, Duane S., 260,544, Cl. D21-246.000.
Ament, Donald S.; and Ament, Duane S., 260,545, Cl. D21-247.000.
Ament, Donald S.; and Ament, Duane S., 260,546, Cl. D21-247.000.
Ament, Donald S.; and Ament, Duane S., 260,547, Cl. D21-247.000.

American Standard Inc.: *See—*
Tang, Myra, 260,551, Cl. D23-58.000.

Amfesco Industries, Inc.: *See—*
Greenblatt, David; and Spinoza, Rick, 260,447, Cl. D2-319.000.
Greenblatt, David; and Spinoza, Rick, 260,448, Cl. D2-319.000.
Greenblatt, David; and Spinoza, Rick, 260,449, Cl. D2-319.000.
Greenblatt, David; and Spinoza, Rick, 260,450, Cl. D2-319.000.
Greenblatt, David; and Spinoza, Rick, 260,451, Cl. D2-321.000.
Greenblatt, David; and Spinoza, Rick, 260,452, Cl. D2-321.000.

Andis Clipper Company: *See—*
Andis, Matthew L., 260,561, Cl. D28-13.000.

Andis, Matthew L., to Andis Clipper Company. Hair dryer. 260,561, 9-1-81, Cl. D28-13.000.

Angelakos, Nicholas P., to Lancaster Colony Corporation. Design for an alcoholic beverage chiller. 260,470, 9-1-81, Cl. D7-3.000.

Arlac-Werk Heiko Ippen: *See—*
Halm, Hans, 260,534, Cl. D19-76.000.

Ashworth Bros., Inc.: *See—*
Roinestad, Gerald C., 260,506, Cl. D12-60.000.

Avramovich, Radosav, to Daniel Woodhead, Inc. Electrical connector housing. 260,511, 9-1-81, Cl. D13-24.000.

Azuma, Daisaburo, to Pentel Kabushiki Kaisha. Penpoint or similar article. 260,533, 9-1-81, Cl. D19-55.000.

Baker, Brian G. Carton blank. 260,490, 9-1-81, Cl. D9-433.000.

Barbee, Marvin L.: *See—*
Butcher, Donald A.; and Barbee, Marvin L., 260,466, Cl. D6-157.000.

Barr, Josef J. Jeweled bracelet. 260,500, 9-1-81, Cl. D11-6.000.

Barr, Josef J. Bracelet or similar article. 260,501, 9-1-81, Cl. D11-6.000.

Belaiche, Serge, to Serdaneli. Door handle. 260,478, 9-1-81, Cl. D8-308.000.

Belyaev, Sergei M.: *See—*
Petrovsky, Viktor A.; Gassanov, Lev G.; Belyaev, Sergei M.; Kochetov, Lev A.; Kryzhanovsky, Vitaly L.; Palamarchuk, Andrei A.; Ushakov, Viktor D.; Timraleev, Rafail J.; Parfenjuk, Vitaly M.; Pilipenko, Alexandr S.; Goncharov, Petr A.; and Ponomarenko, Anatoly I., 260,496, Cl. D10-46.000.

Bergen Barrel & Drum Co.: *See—*
Zilbert, Seymour, 260,569, Cl. D99-51.000.

Biro, Michael; and Muckenfuss, Hans, to Rolf C. Hagen Ltd. Combined bird cage roof and bottom tray. 260,565, 9-1-81, Cl. D30-4.000.

Biro, Michael; and Muckenfuss, Hans, to Rolf C. Hagen Ltd. Combined bird cage roof and bottom tray. 260,566, 9-1-81, Cl. D30-4.000.

Blake, Joseph W.; and Allen, Anne W., to Dart Industries Inc. Rotatable food serving assembly. 260,469, 9-1-81, Cl. D7-2.000.

Blankenship, Jerry: *See—*
Rains, Harold C., III; and Blankenship, Jerry, 260,523, Cl. D15-4.000.

Bovet, Thomas, to Uptrend Products Limited. Index. 260,535, 9-1-81, Cl. D19-76.000.

Bowman Construction Supply, Inc.: *See—*
Bowman, William E., 260,557, Cl. D25-74.000.

Bowman, William E., to Bowman Construction Supply, Inc. Expansion joint sealing strip assembly for roadways. 260,557, 9-1-81, Cl. D25-74.000.

Bragg, Deborah A. Bib or similar article. 260,446, 9-1-81, Cl. D2-228.000.

Bristol Corporation: *See*—
Hetzler, Jack L.; and Carpenter, John L., 260,550, Cl. D23-54.000.

Broyhill Furniture Industries, Inc.: *See*—
Smith, Melbourne F., Jr., 260,465, Cl. D6-154.000.

Butcher, Donald A.; and Barbee, Marvin L. Fabric display rack. 260,466, 9-1-81, Cl. D6-157.000.

Carey, Roy E. Reel. 260,479, 9-1-81, Cl. D8-359.000.

Carlson, Ronald. Clasp for baby diapers. 260,453, 9-1-81, Cl. D2-422.000.

Carpenter, John L.: *See*—
Hetzler, Jack L.; and Carpenter, John L., 260,550, Cl. D23-54.000.

Carrier, Stephen J.: *See*—
Davies, Frederick S.; and Carrier, Stephen J., 260,456, Cl. D3-35.000.

Catte, Pierre, to Cibie Projecteurs. Headlight. 260,558, 9-1-81, Cl. D26-29.000.

Cherry, Richard S., to Phillips-Parkway Corporation. Stackable tray. 260,568, 9-1-81, Cl. D99-44.000.

Cheshaek, Gloria. Combined clock face and support. 260,499, 9-1-81, Cl. D10-125.000.

Chin, Arthur W.: *See*—
Welch, Robert A.; and Chin, Arthur W., 260,515, Cl. D14-11.000.

Christiani, Peter, to Gourmet-Topf, Inc. Covered butter dish. 260,473, 9-1-81, Cl. D7-84.000.

Cibie Projecteurs: *See*—
Catte, Pierre, 260,558, Cl. D26-29.000.

Clairol Incorporated: *See*—
Mack, William; and Rogers, Meyrick K., 260,562, Cl. D28-53.000.

Cohen, Steve J.; and Hillebrand, Cory W. Support stand for a loudspeaker. 260,461, 9-1-81, Cl. D6-85.000.

Comstock, Kenneth C. Housing for electrical circuits. 260,513, 9-1-81, Cl. D13-40.000.

Conrac Corporation: *See*—
Macmillan, John M.; and Costa, Hilario S., 260,498, Cl. D10-106.000.

Container Corporation of America: *See*—
Maclin, Gregory P., 260,491, Cl. D9-433.000.

Continental Group, Inc., The: *See*—
Grubman, Alan A.; and Hasegawa, Gary K., 260,487, Cl. D9-416.000.

Costa, Hilario S.: *See*—
Macmillan, John M.; and Costa, Hilario S., 260,498, Cl. D10-106.000.

Daniel Woodhead, Inc.: *See*—
Avramovich, Radosav, 260,511, Cl. D13-24.000.

Dart Industries Inc.: *See*—
Blake, Joseph W.; and Allen, Anne W., 260,469, Cl. D7-2.000.
Scott, Kenneth E., 260,492, Cl. D9-452.000.

Data Packaging Corporation: *See*—
Pepicelli, Pasquale L., Jr.; Roche, David; Mathus, Gregory; and Lowry, Alan B., 260,454, Cl. D3-35.000.

Davies, Frederick S.; and Carrier, Stephen J. Carrying case for cassettes and cassette player. 260,456, 9-1-81, Cl. D3-35.000.

Decker, Wil. Electronic baby grand piano. 260,528, 9-1-81, Cl. D17-8.000.

Della Beffa, Giorgio. Writing instrument. 260,531, 9-1-81, Cl. D19-47.000.

DeLorean Motor Company: *See*—
Powers, James R., 260,510, Cl. D12-211.000.

DeMars, Donald A., to Lefkowitz, LeRoy M. Wall or partition hung coat hook. 260,480. 9-1-81, Cl. D8-367.000.

Dinh Van, Jean. Wristwatch. 260,494, 9-1-81, Cl. D10-39.000.

Djurinec, Marijan, to Smith & Stone Limited. Electric plug. 260,512, 9-1-81, Cl. D13-28.000.

Douglas, Jack. Cup holder. 260,471, 9-1-81, Cl. D7-70.000.

Engelmann, Stefan. Spectacle holder. 260,527, 9-1-81, Cl. D16-82.000.

Flower, Milton O., to Max Factor & Co. Eye makeup applicator. 260,560, 9-1-81, Cl. D28-7.000.

Fotiu, Eustace: *See*—
Jedzinak, John E.; Fotiu, Eustace; and Markrow, Fred, 260,564, Cl. D28-89.000.

Gassanov, Lev G.: *See*—
Petrovsky, Viktor A.; Gassanov, Lev G.; Belyaev, Sergei M.; Kochetov, Lev A.; Kryzhanovsky, Vitaly L.; Palamarchuk, Andrei A.; Ushakov, Viktor D.; Timraleev, Rafail J.; Parfenjuk, Vitaly M.; Pilipenko, Alexandr S.; Goncharov, Petr A.; and Ponomarenko, Anatoly I., 260,496, Cl. D10-46.000.

Gell, Peter, to Tuscan Industries Pty. Limited. Magnetic tape cassette. 260,514, 9-1-81, Cl. D14-11.000.

Giannotti, Vincent, Jr.; Kapper, Henry; and Sabella, Edward J., to International Business Machines Corporation. Terminal printer cover. 260,516, 9-1-81, Cl. D14-111.000.

Goettner, Michael K.; and Plummer, James E., to Owens-Illinois, Inc. Bottle. 260,484, 9-1-81, Cl. D9-378.000.

Goncharov, Petr A.: *See*—
Petrovsky, Viktor A.; Gassanov, Lev G.; Belyaev, Sergei M.; Kochetov, Lev A.; Kryzhanovsky, Vitaly L.; Palamarchuk, Andrei A.; Ushakov, Viktor D.; Timraleev, Rafail J.; Parfenjuk, Vitaly M.; Pilipenko, Alexandr S.; Goncharov, Petr A.; and Ponomarenko, Anatoly I., 260,496, Cl. D10-46.000.

Gould and Associates, Inc.: *See*—
Weiland, Herbert C., 260,483, Cl. D9-374.000.

Gourmet-Topf, Inc.: *See*—
Christiani, Peter, 260,473, Cl. D7-84.000.

Greenblatt, David; and Spinoza, Rick, to Amfesco Industries, Inc. Sole and toe portions of a shoe. 260,447, 9-1-81, Cl. D2-319.000.

Greenblatt, David; and Spinoza, Rick, to Amfesco Industries, Inc. Sole and toe portions of a shoe. 260,448, 9-1-81, Cl. D2-319.000.

Greenblatt, David; and Spinoza, Rick, to Amfesco Industries, Inc. Sole and toe portions of a shoe. 260,449, 9-1-81, Cl. D2-319.000.

Greenblatt, David; and Spinoza, Rick, to Amfesco Industries, Inc. Sole and toe portions of a shoe. 260,450, 9-1-81, Cl. D2-319.000.

Greenblatt, David; and Spinoza, Rick, to Amfesco Industries, Inc. Sole of a shoe. 260,451, 9-1-81, Cl. D2-321.000.

Greenblatt, David; and Spinoza, Rick, to Amfesco Industries, Inc. Sole of a shoe. 260,452, 9-1-81, Cl. D2-321.000.

Grubman, Alan A.; and Hasegawa, Gary K., to Continental Group, Inc., The. Can or the like. 260,487, 9-1-81, Cl. D9-416.000.

Guretzky, Harold. Multi-J antenna. 260,522, 9-1-81, Cl. D14-86.000.

Guzzetta, Matthew P. Motorcycle fairing. 260,509, 9-1-81, Cl. D12-182.000.

Hall, Charles D. Adjustable trash bag holder. 260,475, 9-1-81, Cl. D7-193.000.

Halm, Hans, to Arlac-Werk Heiko Ippen. Telephone register. 260,534, 9-1-81, Cl. D19-76.000.

Hardy, Tommy R., to International Business Machines Corporation. Printer. 260,517, 9-1-81, Cl. D14-111.000.

Hasegawa, Gary K.: *See*—
Grubman, Alan A.; and Hasegawa, Gary K., 260,487, Cl. D9-416.000.

Haswell, Robert F. Tape cassette holder. 260,455, 9-1-81, Cl. D3-35.000.

Hetzler, Jack L.; and Carpenter, John L., to Bristol Corporation. Wash stand. 260,550, 9-1-81, Cl. D23-54.000.

Hillebrand, Cory W.: *See*—
Cohen, Steve J.; and Hillebrand, Cory W., 260,461, Cl. D6-85.000.

Holec, Lubomir. Combined table and aquarium or the like. 260,567, 9-1-81, Cl. D30-11.000.

Holland, Darrell E. Safety lock for hand gun. 260,548, 9-1-81, Cl. D22-7.000.

Hoshino, Kunio: *See*—
Nishimoto, Teruyuki; Hoshino, Kunio; Ohta, Kikuo; Mishiro, Benito; Kido, Katsutoshi; and Kosugi, Kanji, 260,521, Cl. D14-70.000.

Howard, Charlie J.; and Peart, Edward L., to Sybron Corporation. Wind chill indicator. 260,497, 9-1-81, Cl. D10-57.000.

Huebner, Donna L. Pillow. 260,468, 9-1-81, Cl. D6-202.000.

Imus, Keith N. Wine rack. 260,463, 9-1-81, Cl. D6-113.000.

International Business Machines Corporation: *See*—
Giannotti, Vincent, Jr.; Kapper, Henry; and Sabella, Edward J., 260,516, Cl. D14-111.000.
Hardy, Tommy R., 260,517, Cl. D14-111.000.

J.G.A. Enterprises, Inc.: *See*—
Alex, James G., 260,538, Cl. D21-35.000.

Jedzinak, John E.; Fotiu, Eustace; and Markrow, Fred, to Revlon, Inc. Combined cosmetic stick and a case therefor. 260,564, 9-1-81, Cl. D28-89.000.

Jogbra Inc.: *See*—
Schreiber, Hinda; and Lindahl, Eugenie Z., 260,445, Cl. D2-210.000.

Jones, Jack L., to Kaman Sciences Corporation. Fishhook hone. 260,477, 9-1-81, Cl. D8-98.000.

Kaman Sciences Corporation: *See*—
Jones, Jack L., 260,477, Cl. D8-98.000.

Kapper, Henry: *See*—
Giannotti, Vincent, Jr.; Kapper, Henry; and Sabella, Edward J., 260,516, Cl. D14-111.000.

Kelsey Hayes Co.: *See*—
Weiner, Paul, 260,508, Cl. D12-174.000.

Kido, Katsutoshi: *See*—
Nishimoto, Teruyuki; Hoshino, Kunio; Ohta, Kikuo; Mishiro, Benito; Kido, Katsutoshi; and Kosugi, Kanji, 260,521, Cl. D14-70.000.

Kingston, George W.: *See*—
Norcross, David R.; and Kingston, George W., 260,481, Cl. D8-394.000.

Kinneary, Robert P. Golf ball package. 260,488, 9-1-81, Cl. D9-418.000.

Kloke, Werner, to Prem Gandy. Extruded frame element. 260,556, 9-1-81, Cl. D25-74.000.

Knaus, Gregory J. Combined locking pliers clamp. 260,476, 9-1-81, Cl. D8-55.000.

Kochetov, Lev A.: *See*—
Petrovsky, Viktor A.; Gassanov, Lev G.; Belyaev, Sergei M.; Kochetov, Lev A.; Kryzhanovsky, Vitaly L.; Palamarchuk, Andrei A.; Ushakov, Viktor D.; Timraleev, Rafail J.; Parfenjuk, Vitaly M.; Pilipenko, Alexandr S.; Goncharov, Petr A.; and Ponomarenko, Anatoly I., 260,496, Cl. D10-46.000.

Kosugi, Kanji; and Mishiro, Benito, to Matsushita Electric Industrial Co., Ltd. Automobile overhead combined radio and cassette player console or similar article. 260,507, 9-1-81, Cl. D12-155.000.

Kosugi, Kanji: *See*—
Nishimoto, Teruyuki; Hoshino, Kunio; Ohta, Kikuo; Mishiro, Benito; Kido, Katsutoshi; and Kosugi, Kanji, 260,521, Cl. D14-70.000.

Kryzhanovsky, Vitaly L.: *See—*
Petrovsky, Viktor A.; Gassanov, Lev G.; Belyaev, Sergei M.; Kochetov, Lev A.; Kryzhanovsky, Vitaly L.; Palamarchuk, Andrei A.; Ushakov, Viktor D.; Timraleev, Rafail J.; Parfenjuk, Vitaly M.; Pilipenko, Alexandr S.; Goncharov, Petr A.; and Ponomarenko, Anatoly I., 260,496, Cl. D10-46.000.

Lamb, Thomas. Lounge chair. 260,459, 9-1-81, Cl. D6-41.000.

Lambert, Lloyd J., Jr. Multi station physical exerciser. 260,542, 9-1-81, Cl. D21-195.000.

Lancaster Colony Corporation: *See—*
Angelakos, Nicholas P., 260,470, Cl. D7-3.000.

Larson, Kenneth W., to Motorola, Inc. Vehicular two-way radio control unit or similar article. 260,518, 9-1-81, Cl. D14-53.000.

Lassiter, Will M. Channel drill and bolt combination. 260,525, 9-1-81, Cl. D15-139.000.

Lee, Paul W. Fishing lure. 260,549, 9-1-81, Cl. D22-27.000.

Lefkowitz, LeRoy M.: *See—*
DeMars, Donald A., 260,480, Cl. D8-367.000.

Lindahl, Eugenie Z.: *See—*
Schreiber, Hinda; and Lindahl, Eugenie Z., 260,445, Cl. D2-210.000.

Link, Cabanne H. Watch case. 260,493, 9-1-81, Cl. D10-38.000.

Lowry, Alan B.: *See—*
Pepicelli, Pasquale L., Jr.; Roche, David; Mathus, Gregory; and Lowry, Alan B., 260,454, Cl. D3-35.000.

Mack, William; and Rogers, Meyrick K., to Clairol Incorporated. Hair trimmer. 260,562, 9-1-81, Cl. D28-53.000.

Maclin, Gregory P., to Container Corporation of America. Carton. 260,491, 9-1-81, Cl. D9-433.000.

Macmillan, John M.; and Costa, Hilario S., to Conrac Corporation. Smoke detector housing. 260,498, 9-1-81, Cl. D10-106.000.

Markrow, Fred: *See—*
Jedzinak, John E.; Fotiu, Eustace; and Markrow, Fred, 260,564, Cl. D28-89.000.

Martinelli, Lawrence R., to United States Gypsum Company. Decorative window panel for doors. 260,555, 9-1-81, Cl. D25-72.000.

Mathus, Gregory: *See—*
Pepicelli, Pasquale L., Jr.; Roche, David; Mathus, Gregory; and Lowry, Alan B., 260,454, Cl. D3-35.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Kosugi, Kanji; and Mishiro, Benito, 260,507, Cl. D12-155.000.
Nishimoto, Teruyuki; Hoshino, Kunio; Ohta, Kikuo; Mishiro, Benito; Kido, Katsutoshi; and Kosugi, Kanji, 260,521, Cl. D14-70.000.

Max Factor & Co.: *See—*
Flower, Milton O., 260,560, Cl. D28-7.000.

Mayuzumi, Masaki, to Tomy Kogyo Co., Inc. Pocket game housing. 260,537, 9-1-81, Cl. D21-10.000.

McMullan, Robert G., to SCM (Canada) Limited. Tear strip packaging container. 260,486, 9-1-81, Cl. D9-416.000.

Melamed, Stephen; and Sonshine, Samuel. Toilet article caddy. 260,462, 9-1-81, Cl. D6-86.000.

Miracle Recreation Equipment Company: *See—*
Ament, Donald S.; and Ament, Duane S., 260,543, Cl. D21-244.000.
Ament, Donald S.; and Ament, Duane S., 260,544, Cl. D21-246.000.
Ament, Donald S.; and Ament, Duane S., 260,545, Cl. D21-247.000.
Ament, Donald S.; and Ament, Duane S., 260,546, Cl. D21-247.000.
Ament, Donald S.; and Ament, Duane S., 260,547, Cl. D21-247.000.

Mishiro, Benito: *See—*
Kosugi, Kanji; and Mishiro, Benito, 260,507, Cl. D12-155.000.
Nishimoto, Teruyuki; Hoshino, Kunio; Ohta, Kikuo; Mishiro, Benito; Kido, Katsutoshi; and Kosugi, Kanji, 260,521, Cl. D14-70.000.

Motorola, Inc.: *See—*
Larson, Kenneth W., 260,518, Cl. D14-53.000.
Nagele, Albert L., 260,520, Cl. D14-68.000.

Muckenfuss, Hans: *See—*
Biro, Michael; and Muckenfuss, Hans, 260,565, Cl. D30-4.000.
Biro, Michael; and Muckenfuss, Hans, 260,566, Cl. D30-4.000.

Nagele, Albert L., to Motorola, Inc. Vehicular two-way radio or similar article. 260,520, 9-1-81, Cl. D14-68.000.

Nishimoto, Teruyuki; Hoshino, Kunio; Ohta, Kikuo; Mishiro, Benito; Kido, Katsutoshi; and Kosugi, Kanji, to Matsushita Electric Industrial Co., Ltd. Radio receiver. 260,521, 9-1-81, Cl. D14-70.000.

Norcross, David R.; and Kingston, George W., to TECO Products & Testing Corporation. H-Clip or similar article. 260,481, 9-1-81, Cl. D8-394.000.

Nottingham, John R.; and Spirk, John W., Jr. Toy dressing table or similar article. 260,540, 9-1-81, Cl. D21-121.000.

Ohta, Kikuo: *See—*
Nishimoto, Teruyuki; Hoshino, Kunio; Ohta, Kikuo; Mishiro, Benito; Kido, Katsutoshi; and Kosugi, Kanji, 260,521, Cl. D14-70.000.

Ortal, Raymond, to Societe Stendhal. Bottle. 260,485, 9-1-81, Cl. D9-406.000.

Osterman, Louis D. Hanging chair. 260,460, 9-1-81, Cl. D6-47.000.

Owens-Illinois, Inc.: *See—*
Goettner, Michael K.; and Plummer, James E., 260,484, Cl. D9-378.000.

Palamarchuk, Andrei A.: *See—*
Petrovsky, Viktor A.; Gassanov, Lev G.; Belyaev, Sergei M.; Kochetov, Lev A.; Kryzhanovsky, Vitaly L.; Palamarchuk, Andrei A.; Ushakov, Viktor D.; Timraleev, Rafail J.; Parfenjuk, Vitaly M.; Pilipenko, Alexandr S.; Goncharov, Petr A.; and Ponomarenko, Anatoly I., 260,496, Cl. D10-46.000.

Paramount Pictures Corporation: *See—*
Rubin, Richard M., 260,539, Cl. D21-111.000.

Parfenjuk, Vitaly M.: *See—*
Petrovsky, Viktor A.; Gassanov, Lev G.; Belyaev, Sergei M.; Kochetov, Lev A.; Kryzhanovsky, Vitaly L.; Palamarchuk, Andrei A.; Ushakov, Viktor D.; Timraleev, Rafail J.; Parfenjuk, Vitaly M.; Pilipenko, Alexandr S.; Goncharov, Petr A.; and Ponomarenko, Anatoly I., 260,496, Cl. D10-46.000.

Pearse, John. Guitar pick. 260,529, 9-1-81, Cl. D17-20.000.

Peart, Edward L.: *See—*
Howard, Charlie J.; and Peart, Edward L., 260,497, Cl. D10-57.000.

Pentel Kabushiki Kaisha: *See—*
Azuma, Daisaburo, 260,533, Cl. D19-55.000.
Sakaoka, Gouji, 260,532, Cl. D19-53.000.

Pepicelli, Pasquale L., Jr.; Roche, David; Mathus, Gregory; and Lowry, Alan B., to Data Packaging Corporation. Cassette carrying case. 260,454, 9-1-81, Cl. D3-35.000.

Petrovsky, Viktor A.; Gassanov, Lev G.; Belyaev, Sergei M.; Kochetov, Lev A.; Kryzhanovsky, Vitaly L.; Palamarchuk, Andrei A.; Ushakov, Viktor D.; Timraleev, Rafail J.; Parfenjuk, Vitaly M.; Pilipenko, Alexandr S.; Goncharov, Petr A.; and Ponomarenko, Anatoly I. Portable radar-type speed meter. 260,496, 9-1-81, Cl. D10-46.000.

Phillips-Parkway Corporation: *See—*
Cherry, Richard S., 260,568, Cl. D99-44.000.

Pilipenko, Alexandr S.: *See—*
Petrovsky, Viktor A.; Gassanov, Lev G.; Belyaev, Sergei M.; Kochetov, Lev A.; Kryzhanovsky, Vitaly L.; Palamarchuk, Andrei A.; Ushakov, Viktor D.; Timraleev, Rafail J.; Parfenjuk, Vitaly M.; Pilipenko, Alexandr S.; Goncharov, Petr A.; and Ponomarenko, Anatoly I., 260,496, Cl. D10-46.000.

Plummer, James E.: *See—*
Goettner, Michael K.; and Plummer, James E., 260,484, Cl. D9-378.000.

Ponomarenko, Anatoly I.: *See—*
Petrovsky, Viktor A.; Gassanov, Lev G.; Belyaev, Sergei M.; Kochetov, Lev A.; Kryzhanovsky, Vitaly L.; Palamarchuk, Andrei A.; Ushakov, Viktor D.; Timraleev, Rafail J.; Parfenjuk, Vitaly M.; Pilipenko, Alexandr S.; Goncharov, Petr A.; and Ponomarenko, Anatoly I., 260,496, Cl. D10-46.000.

Powers, James R., to DeLorean Motor Company. Automobile wheel. 260,510, 9-1-81, Cl. D12-211.000.

Prem Gandy: *See—*
Kloke, Werner, 260,556, Cl. D25-74.000.

Princeton Industries Corporation: *See—*
Wildgen, Leo F., 260,504, Cl. D11-140.000.
Wildgen, Leo F., 260,505, Cl. D11-140.000.

Pritchard, William F. Soap dispenser. 260,489, 9-1-81, Cl. D9-432.000.

Rains, Harold C., III; and Blankenship, Jerry. Trolling motor control. 260,523, 9-1-81, Cl. D15-4.000.

Revlon, Inc.: *See—*
Jedzinak, John E.; Fotiu, Eustace; and Markrow, Fred, 260,564, Cl. D28-89.000.
Scalice, John J., 260,559, Cl. D28-7.000.

Rhine, David A. Ball rack. 260,467, 9-1-81, Cl. D6-188.000.

Roach, William J. Micropipetting device. 260,554, 9-1-81, Cl. D24-55.000.

Roche, David: *See—*
Pepicelli, Pasquale L., Jr.; Roche, David; Mathus, Gregory; and Lowry, Alan B., 260,454, Cl. D3-35.000.

Rogers, Meyrick K.: *See—*
Mack, William; and Rogers, Meyrick K., 260,562, Cl. D28-53.000.

Roinestad, Gerald C., to Ashworth Bros., Inc. Conveyor belt. 260,506, 9-1-81, Cl. D12-60.000.

Rolf C. Hagen Ltd.: *See—*
Biro, Michael; and Muckenfuss, Hans, 260,565, Cl. D30-4.000.
Biro, Michael; and Muckenfuss, Hans, 260,566, Cl. D30-4.000.

Rubin, Richard M., to Paramount Pictures Corporation. Toy console. 260,539, 9-1-81, Cl. D21-111.000.

Rumble, Clive S. Storage unit for tape cassettes and cartridges. 260,457, 9-1-81, Cl. D3-35.000.

Ryder, Francis E.: *See—*
Thomas, Michael D.; and Ryder, Francis E., 260,552, Cl. D24-9.000.

Ryder International Corporation: *See—*
Thomas, Michael D.; and Ryder, Francis E., 260,552, Cl. D24-9.000.

Saaty, Samir N. Clipboard. 260,536, 9-1-81, Cl. D19-88.000.

Sabella, Edward J.: *See—*
Giannotti, Vincent, Jr.; Kapper, Henry; and Sabella, Edward J., 260,516, Cl. D14-111.000.

Sakaoka, Gouji, to Pentel Kabushiki Kaisha. Casing for an eraser or the like. 260,532, 9-1-81, Cl. D19-53.000.

Satoh, Yoshitoshi, to Yamamoto Electric Industrial Co., Ltd. Foot operated controller for sewing machine. 260,524, 9-1-81, Cl. D15-72.000.

Satterfield, James C., to Tire Cosmotology, Inc. Tire refinishing machine. 260,526, 9-1-81, Cl. D15-199.000.

Scalice, John J., to Revlon, Inc. Combined cosmetic pencil and brush. 260,559, 9-1-81, Cl. D28-7.000.

Schreiber, Hinda; and Lindahl, Eugenie Z., to Jogbra Inc. Athletic shirt. 260,445, 9-1-81, Cl. D2-210.000.

SCM (Canada) Limited: *See*—
McMullan, Robert G., 260,486, Cl. D9-416.000.
Scott, Kenneth E., to Dart Industries Inc. Container closure or the like. 260,492, 9-1-81, Cl. D9-452.000.
Serdaneli: *See*—
Belaiche, Serge, 260,478, Cl. D8-308.000.
Sharp Corporation: *See*—
Yamasaki, Tsutomu, 260,530, Cl. D18-7.000.
Siegel, Milton I., to AMBA Marketing Systems, Inc. Handbag. 260,458, 9-1-81, Cl. D3-48.000.
Smith, Donna L. Kitchen paring knife. 260,474, 9-1-81, Cl. D7-147.000.
Smith, Melbourne F., Jr., to Broyhill Furniture Industries, Inc. Buffet. 260,465, 9-1-81, Cl. D6-154.000.
Smith & Stone Limited: *See*—
Djurinec, Marijan, 260,512, Cl. D13-28.000.
Societe Stendhal: *See*—
Ortal, Raymond, 260,485, Cl. D9-406.000.
Sonshine, Samuel: *See*—
Melamed, Stephen; and Sonshine, Samuel, 260,462, Cl. D6-86.000.
Spinoza, Rick: *See*—
Greenblatt, David; and Spinoza, Rick, 260,447, Cl. D2-319.000.
Greenblatt, David; and Spinoza, Rick, 260,448, Cl. D2-319.000.
Greenblatt, David; and Spinoza, Rick, 260,449, Cl. D2-319.000.
Greenblatt, David; and Spinoza, Rick, 260,450, Cl. D2-319.000.
Greenblatt, David; and Spinoza, Rick, 260,451, Cl. D2-321.000.
Greenblatt, David; and Spinoza, Rick, 260,452, Cl. D2-321.000.
Spirk, John W., Jr.: *See*—
Nottingham, John R.; and Spirk, John W., Jr., 260,540, Cl. D21-121.000.
Stangarone, Nickolas G. Illuminated display. 260,503, 9-1-81, Cl. D11-132.000.
Sun, Ng C. Toy printer. 260,541, 9-1-81, Cl. D21-127.000.
Sybron Corporation: *See*—
Howard, Charlie J.; and Peart, Edward L., 260,497, Cl. D10-57.000.
Tang, Myra, to American Standard Inc. Lavatory or the like. 260,551, 9-1-81, Cl. D23-58.000.
TECO Products & Testing Corporation: *See*—
Norcross, David R.; and Kingston, George W., 260,481, Cl. D8-394.000.
Telefonaktiebolaget L M Ericsson: *See*—
Thames, Hans G., 260,519, Cl. D14-60.000.
Texas Instruments Incorporated: *See*—
Welch, Robert A.; and Chin, Arthur W., 260,515, Cl. D14-11.000.
Thames, Hans G., to Telefonaktiebolaget L M Ericsson. Telephone key base. 260,519, 9-1-81, Cl. D14-60.000.
Thomas, Michael D.; and Ryder, Francis E., to Ryder International Corporation. Contact lens sterilizer unit. 260,552, 9-1-81, Cl. D24-9.000.
Timraleev, Rafail J.: *See*—
Petrovsky, Viktor A.; Gassanov, Lev G.; Belyaev, Sergei M.; Kochetov, Lev A.; Kryzhanovsky, Vitaly L.; Palamarchuk, Andrei A.; Ushakov, Viktor D.; Timraleev, Rafail J.; Parfenjuk, Vitaly M.; Pilipenko, Alexandr S.; Goncharov, Petr A.; and Ponomarenko, Anatoly I., 260,496, Cl. D10-46.000.
Tire Cosmotology, Inc.: *See*—
Satterfield, James C., 260,526, Cl. D15-199.000.
Tomy Kogyo Co., Inc.: *See*—
Mayuzumi, Masaki, 260,537, Cl. D21-10.000.
Turcotte, Sidney J. E., Jr. Stand for drinking glasses. 260,472, 9-1-81, Cl. D7-71.000.
Tuscan Industries Pty. Limited: *See*—
Gell, Peter, 260,514, Cl. D14-11.000.
United States Gypsum Company: *See*—
Martinelli, Lawrence R., 260,555, Cl. D25-72.000.
Uptrend Products Limited: *See*—
Bovet, Thomas, 260,535, Cl. D19-76.000.
Ushakov, Viktor D.: *See*—
Petrovsky, Viktor A.; Gassanov, Lev G.; Belyaev, Sergei M.; Kochetov, Lev A.; Kryzhanovsky, Vitaly L.; Palamarchuk, Andrei A.; Ushakov, Viktor D.; Timraleev, Rafail J.; Parfenjuk, Vitaly M.; Pilipenko, Alexandr S.; Goncharov, Petr A.; and Ponomarenko, Anatoly I., 260,496, Cl. D10-46.000.
Vafi, Houshang. Talisman. 260,502, 9-1-81, Cl. D11-75.000.
Von Gunten, Lee L. Timer. 260,495, 9-1-81, Cl. D10-40.000.
Walsh, Stephen W., Jr. Wall brush. 260,563, 9-1-81, Cl. D28-63.000.
Weiland, Herbert C., to Gould and Associates, Inc. Bottle. 260,483, 9-1-81, Cl. D9-374.000.
Weiner, Paul, to Kelsey Hayes Co. Tow vehicle brake pedal attachment for an electric trailer brake system. 260,508, 9-1-81, Cl. D12-174.000.
Welch, Robert A.; and Chin, Arthur W., to Texas Instruments Incorporated. Case for interchangeable program module for a personal computer or the like. 260,515, 9-1-81, Cl. D14-11.000.
Wildgen, Leo F., to Princeton Industries Corporation. Standing plaque. 260,504, 9-1-81, Cl. D11-140.000.
Wildgen, Leo F., to Princeton Industries Corporation. Standing plaque. 260,505, 9-1-81, Cl. D11-140.000.
Wu, An C. Vibrating massaging mask. 260,553, 9-1-81, Cl. D24-40.000.
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NOTE.—First number, class; second number, subclass; third number, patent number

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909 4,287,520

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	228	260,446		188	260,467		418	260,488		182	260,509	D18—	7	260,530		58	260,551
	319	260,447		202	260,468		432	260,489		211	260,510	D19—	47	260,531	D24—	9	260,552
		260,448	D7—	2	260,469		433	260,490	D13—	24	260,511		53	260,532		40	260,553
		260,449		3	260,470			260,491		28	260,512		55	260,533		55	260,554
		260,450		70	260,471		452	260,492		40	260,513		76	260,534	D25—	72	260,555
	321	260,451		71	260,472	D10—	38	260,493	D14—	11	260,514			260,535		74	260,556
		260,452		84	260,473		39	260,494			260,515		88	260,536			260,557
	422	260,453		147	260,474		40	260,495		53	260,518	D21—	10	260,537	D26—	29	260,558
D3—	35	260,454		193	260,475		46	260,496		60	260,519		35	260,538	D28—	7	260,559
		260,455	D8—	55	260,476		57	260,497		68	260,520		111	260,539			260,560
		260,456		98	260,477		106	260,498		70	260,521		121	260,540		13	260,561
		260,457		308	260,478		125	260,499		86	260,522		127	260,541		53	260,562
	48	260,458		359	260,479	D11—	6	260,500		111	260,516		195	260,542		63	260,563
D6—	41	260,459		367	260,480			260,501			260,517		244	260,543		89	260,564
	47	260,460		394	260,481		75	260,502	D15—	4	260,523		246	260,544	D30—	4	260,565
	85	260,461	D9—	352	260,482		132	260,503		72	260,524		247	260,545			260,566
	86	260,462		374	260,483		140	260,504		139	260,525			260,546		11	260,567
	113	260,463		378	260,484			260,505		199	260,526			260,547	D99—	44	260,568
	147	260,464		406	260,485	D12—	60	260,506	D16—	82	260,527	D22—	7	260,548		51	260,569
	154	260,465		416	260,486		155	260,507	D17—	8	260,528		27	260,549			

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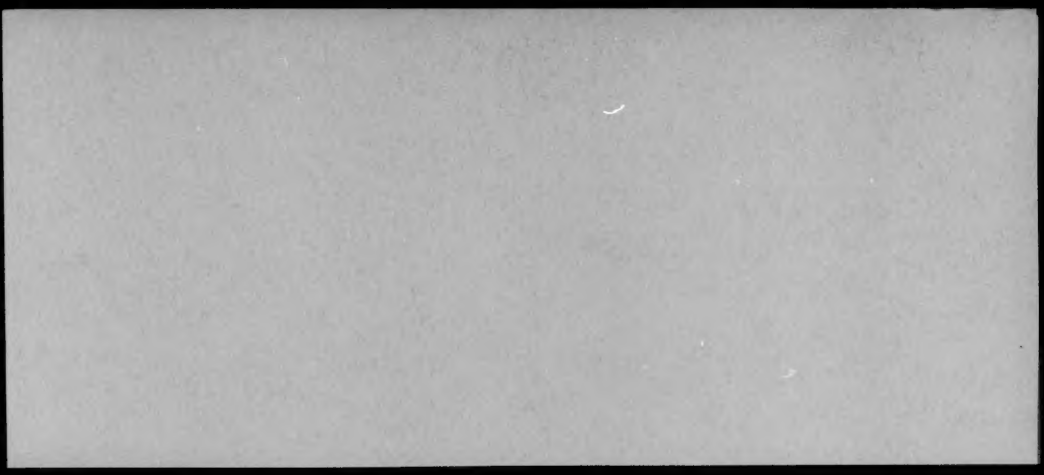

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